PATENT ABSTRACTS OF JAPAN

(11)Publication number : 2002-254158
(43)Date of publication of application : 10.09.2002

(51)Int.Cl. B22D 39/06
B22D 17/30
B22D 41/00
B22D 41/12

(21)Application number : 2001-189650
(22)Date of filing : 22.06.2001

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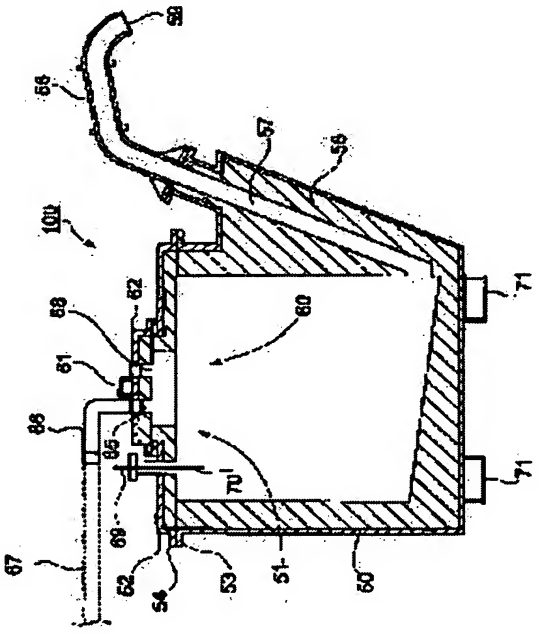
(30)Priority
Priority number : 2000399465 Priority date : 27.12.2000 Priority country : JP

(54) CONTAINER FOR FEEDING MOLTEN METAL

(57)Abstract:
PROBLEM TO BE SOLVED: To prevent the clogging of a piping and a hole used for adjusting the inner pressure.
SOLUTION: The container is used for feeding the molten metal such as molten aluminum, wherein a through-hole 65 for adjusting the inner pressure is provided on a hatch 62, and a piping 66 for adjusting the inner pressure is connected to the through-hole 65, thereby enabling the sticking of a metal to the through-hole 65 for adjusting the inner pressure to be confirmed every time feeding the molten metal into the container 100. Therefor, the clogging of the piping 66 and the through-hole 65 used for adjusting the inner pressure can be previously prevented.



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CLAIMS

[Claim(s)]
[Claim 1]A container for molten-metal supply characterized by comprising the following.
A container which can accommodate molten metal.
A channel which inside and outside of said container are opened for free passage and can be circulated in said molten metal.
A hatch in which it was provided in an upper face part of said container so that opening and closing were possible, and a breakthrough for internal pressure adjustment which opens inside and outside of said container for free passage was provided.

[Claim 2]A container for molten-metal supply with which said hatch is characterized by a thing of an upper face part of said container mostly established in the center in the container for molten-metal supply according to claim 1.
[Claim 3]A container for molten-metal supply providing further piping which was attached to said breakthrough, projected towards the upper part from an upper face part of said container, was horizontally bent in a position of predetermined height in the container for molten-metal supply according to claim 1 or 2, and was drawn horizontally.
[Claim 4]A container for molten-metal supply, wherein said piping is screwed on said breakthrough removable in the container for molten-metal supply according to claim 3.
[Claim 5]A container for molten-metal supply characterized by comprising the following.
A container which can accommodate molten metal, opens inside and outside for free passage, and has a breakthrough for internal pressure adjustment of an upper face part mostly provided in a main position.
A channel which inside and outside of said container are opened for free passage and can be circulated in said molten metal.

[Claim 6]A container for molten-metal supply, wherein said container possesses further a hatch of an upper face part of the container concerned mostly provided in the central part and said breakthrough is provided in said hatch in the container for molten-metal supply

according to claim 5.

[Claim 7]A container for molten-metal supply providing further piping which could attach to said breakthrough, projected towards the upper part from an upper face part of said container, was horizontally bent in a position of predetermined height in the container for molten-metal supply according to claim 5 or 6, and was drawn horizontally.

[Claim 8]A container for molten-metal supply, wherein said piping is screwed on said container removable in the container for molten-metal supply according to claim 7.

[Claim 9]A container for molten-metal supply characterized by comprising the following.

A container which can accommodate molten metal and has the 1st opening in the upper part.

A channel which inside and outside of said container are opened for free passage and can be circulated in said molten metal.

A lid which is arranged fixed so that the 1st opening of said container may be covered, and has the 2nd opening of a byway rather than said 1st opening in the center mostly.

A hatch in which it was provided in an upper face part of said lid so that opening and closing were possible, and a breakthrough for internal pressure adjustment which opens inside and outside of said container for free passage was provided.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention]This invention relates to the container for molten-metal supply used for conveyance of the aluminum fused, for example.
[0002]
[Description of the Prior Art]At the factory where molding of aluminum is performed using many dies casting machines, supply of an aluminum material is received from the outside not only of the inside of a factory but a factory in many cases. In this case, supplying material with the state where conveyed the ladle which accommodated aluminum in the state where it fused to the factory by the side of molding, and it was fused from the factory by the side of material supplying to each dies casting machine is performed.
[0003]It is structure like a teapot so to speak for which piping for supply was attached to the side attachment wall of the package body in which molten metal is stored, and, as for the ladle used from the former, supplying molten metal to the holding furnace by the side of molding from piping is performed by leaning this ladle.
[0004]
[Problem(s) to be Solved by the Invention]However, in such a ladle, the inclination of the ladle is performed using the fork lift truck, for example, and such work was not necessarily able to be said as a safe thing. Since it was necessary to provide a moving mechanism in a fork lift truck in order to make a ladle incline, composition became special and the technical problem that the worker who became skillful in operation of a fork lift truck for still such operation was needed occurred.
[0005]Therefore, this invention persons have advocated the distribution system of the molten metal using a pressure differential. This system provides piping for deriving molten metal outside at the sealed container, connects piping for supplying an application-of-pressure gas to this container further, and is drawing molten metal from piping for metal derivation to the holding furnace by the side of molding of the exterior by pressurizing the inside of a container.

[0006]However, in the container of the above-mentioned composition, there is a problem of getting blocked easily piping for application-of-pressure gas supplies. In particular, in the above-mentioned system, since a container is carried in a track and carried from a factory via a public road at other factories, it shakes, and there are many things, and, for this reason, the oil level of the molten metal in a container inclines, or a drop scatters within a container, and these adhere to piping for application-of-pressure gas supplies, for example. And in such adhesion, piping **** has occurred, for example in the repeated thing.
[0007]In view of the above situation, the main purpose of this invention is to provide the container for molten-metal supply which can prevent piping for using for internal pressure adjustment, and **** of a hole.
[0008]
[Means for Solving the Problem]In order to solve this technical problem, a molten-metal distribution system concerning a main viewpoint of this invention, Inside and outside of a container which can accommodate molten metal, and said container are opened for free passage, and it is provided in a channel which can be circulated in said molten metal, and an upper face part of said container so that opening and closing are possible, and a hatch in which a breakthrough for internal pressure adjustment which opens inside and outside of said container for free passage was provided is provided.
[0009]Usually, it precedes supplying molten metal in this container, and a container is preheated with warmers, such as a gas burner. This preheating is performed by opening a hatch and inserting some warmers into a container. Therefore, whenever a hatch supplies molten metal in a container, it can be opened. In this invention, since a breakthrough for internal pressure adjustment is provided in such a hatch, adhesion of metal to a breakthrough for [whenever it supplies molten metal in a container] internal pressure adjustment can be checked. And what is necessary is just to remove it each time, when metal has adhered, for example to a breakthrough. Therefore, in this invention, piping for using for internal pressure adjustment and **** of a hole can be prevented beforehand. This hatch is provided with sealing members, such as packing for securing airtightness for an inside of a container, in this invention. As for packing, what has heat resistance, such as a thing made from silicon, is preferred.
[0010]As for a container for molten-metal supply of this invention, said hatch is characterized by a thing of an upper face part of said container mostly established in the center.
[0011]When a container shakes, and an oil level inclines or a drop scatters, a degree to which change and a drop of an oil level scatter more in a direction near a center section is smaller than near the periphery in a container. In this invention, a breakthrough for internal pressure adjustment is provided in a hatch, and adhering to piping and a hole of an upper face part of a container corresponding to a position with a small degree to which change and a drop of an oil level moreover scatter as mentioned above in the hatch for metal to use for internal pressure adjustment since it is mostly provided in the center decreases.

Therefore, in this invention, piping for using for internal pressure adjustment and **** of a hole can be prevented.

[0012]A container for molten-metal supply of this invention is attached to said breakthrough, it projects towards the upper part from an upper face part of said container, and it is horizontally bent in a position of predetermined height, and piping drawn horizontally is provided further.

[0013]In a system for which a container concerning this invention is used, piping from a tank for application-of-pressure gas supplies or a pump for decompression is connected to piping attached to a breakthrough, for example. Such connection is made, whenever it introduces molten metal in a container, or whenever it derives molten metal from the inside of a container. On the other hand, a container with which molten metal is stored is very an elevated temperature, and workability is in a bad state. In a container concerning this invention, a breakthrough for internal pressure adjustment is the composition on the upper surface of a container which exists in the center mostly, and if piping extended up as it is was attached, the workability of connection during the above piping is dramatically bad. On the other hand, a worker can work safely and easily by extending a hand to a connection point during piping by having composition which piping derives horizontally as mentioned above, for example.

[0014]A container for molten-metal supply of this invention is screwed on removable [to said breakthrough] in said piping.

[0015]It becomes possible with constituting from this invention so that piping may be screwed on removable to a breakthrough to detach and attach piping from a breakthrough depending on how like a spanner to use so to speak in the piping itself currently drawn horizontally. Therefore, attachment and detachment of piping can be performed easily, without using a special tool etc. This becomes possible to often check plugging condition of piping, for example, and **** of piping for using for internal pressure adjustment can be prevented beforehand.

[0016]This invention is characterized by a container for molten-metal supply concerning another viewpoint comprising the following.

A container which can accommodate molten metal, opens inside and outside for free passage, and has a breakthrough for internal pressure adjustment of an upper face part mostly provided in a main position.

A channel which inside and outside of said container are opened for free passage and can be circulated in said molten metal.

[0017]As mentioned above, when a container shakes, and an oil level inclines or a drop scatters, a degree to which change and a drop of an oil level scatter more in a direction near a center section is smaller than near the periphery in a container. In this invention, adhering to piping of an upper face part of a container corresponding to a position with a small degree to which change and a drop of an oil level scatter in this way in a

breakthrough for internal pressure adjustment for metal to use for internal pressure adjustment since it is mostly provided in the center, or a hole decreases. Therefore, in this invention, piping for using for internal pressure adjustment and **** of a hole can be prevented.

[0018]As for a container for molten-metal supply of this invention, said container possesses further a hatch of an upper face part of the container concerned mostly provided in the central part, and said breakthrough is provided in said hatch.

[0019]As mentioned above, it usually precedes supplying molten metal in a container, and a container is preheated with a gas burner. This preheating is performed by opening a hatch and inserting a gas burner into a container. Therefore, whenever a hatch supplies molten metal in a container, it can be opened. In this invention, since a breakthrough for internal pressure adjustment is provided in such a hatch, adhesion of metal to a breakthrough for [whenever it supplies molten metal in a container] internal pressure adjustment can be checked. And what is necessary is just to remove it each time, when metal has adhered, for example to a breakthrough. Therefore, in this invention, piping for using for internal pressure adjustment and **** of a hole can be prevented beforehand.

[0020]A container for molten-metal supply of this invention can be attached to said breakthrough, it projects towards the upper part from an upper face part of said container, and it is horizontally bent in a position of predetermined height, and piping drawn horizontally is provided further.

[0021]A container for molten-metal supply concerning another viewpoint of this invention, A container which can accommodate molten metal and has the 1st opening in the upper part, A channel which inside and outside of said container are opened for free passage and can be circulated in said molten metal, A hatch in which it has been arranged fixed so that the 1st opening of said container may be covered, and was provided in an upper face part of a lid which has the 2nd opening of a byway rather than said 1st opening in the center mostly, and said lid so that opening and closing were possible, and a breakthrough for internal pressure adjustment which opens inside and outside of said container for free passage was provided is provided.

[0022]In this invention, since a breakthrough for internal pressure adjustment is provided in such a hatch, adhesion of metal to a breakthrough for [whenever it supplies molten metal in a container] internal pressure adjustment can be checked. Therefore, in this invention, piping for using for internal pressure adjustment and **** of a hole can be prevented beforehand. In this invention, a breakthrough for internal pressure adjustment is provided in a hatch, and adhering to piping and a hole of an upper face part of a container corresponding to a position with a small degree to which change and a drop of an oil level moreover scatter as mentioned above in the hatch for metal to use for internal pressure adjustment since it is mostly provided in the center decreases. Therefore, in this invention, piping for using for internal pressure adjustment and **** of a hole can be prevented. In this invention, since a hatch is provided in an upper face part of a lid, distance of a rear face of

a hatch and an oil level becomes long by thickness of a lid compared with distance of a rear face of a lid, and an oil level. Therefore, a possibility that metal will adhere to a rear face of a hatch in which a breakthrough was provided becomes low. Therefore, in this invention, piping for using for internal pressure adjustment and **** of a hole can be prevented.
[0023]You may make it provide a package body and piping allocated out of a package body from position [center / of said package body] shifted as the above-mentioned container.
[0024]To getting it blocked, shortly after piping has been soaked in a molten metal within a container, in this invention. Since piping has shifted from the center of a package body, if it returns horizontally after displacement to an oil level in a container becomes large and breathes out a molten metal in this state, when it leans, space will be made between a piping lower end and a melt surface, and pipe clogging will be prevented.
[0025]A container of this invention possesses at least one passage which connects the 1st frame that constitutes the 1st space, the 2nd frame allocated so that the 2nd space might be constituted between said 1st frame, and said 1st space and said 2nd space.
[0026]If the 2nd space is lengthened to a vacuum, it will be kept warm, and a fall of insulation efficiency by aging of thermal insulation can be compensated with this invention. If the 1st space is pressurized from the 2nd space side via a passage, after a feeding gas is preheated, it will be supplied to an inside of a container. Therefore, a temperature fall of a molten metal can be suppressed small. In particular, in a feeding culmination, it is easy to generate intermittent regurgitation of a molten metal and a gas, temperature of a molten metal is taken by feeding gas in that case, and viscosity becomes large. Therefore, by preheating a feeding gas, a temperature fall of a molten metal can be controlled and pipe clogging can be prevented effectively. In addition, safe stopping hot water supply can also be performed and time which stopping hot water supply takes can be shortened.
[0027]In this invention, leak of the 1st space can be performed from the 2nd space side via a passage. Although a gas of the 1st space pressurized at the time of a feeding stop is leaked and ** pressure is carried out to ordinary pressure, then, since a gas of the 1st space coexists with a molten metal, it is very an elevated temperature, and if this high temperature gas was leaked directly, its leak valve will be hurt. On the other hand, by performing leak of the 1st space from the 2nd space side via a passage, thermal load concerning a leak valve can be reduced and improvement in reliability of a device and reinforcement can be attained.
[0028]A container of this invention is provided with the following.
The 1st frame that constitutes the 1st space.
The 2nd frame allocated so that the 2nd space might be constituted between said 1st frame.
At least one passage which connects said 1st space and said 2nd space.
The 1st valve connected in said package body, and the 2nd valve of ** inserted on said passage.

[0029]In this invention, improvement in the reliability of time reduction which stopping-hot-water-supply operation takes, or stop operation can be aimed at. That is, the 2nd space is decompressed, at the time of stopping hot water supply, opens wide the 2nd valve of an occasion that opens the 1st valve wide first and carries out ** pressure of the inside of the 1st space, and makes the 1st space negative pressure. Thereby, pull back by the side of perfect stopping hot water supply and also a container of a molten metal in piping can be performed.
[0030]A container of this invention is provided with the following.
Package body.
Piping which has an inclination which is connected near a package body pars basilaris ossis occipitalis, and goes up at least.

[0031]A container of this invention is provided with the following.
Package body.
A septum carried out for 2 minutes opening inside of a package body for free passage near the lower part.
A gutter which said septum was divided for while and was connected to the space side.

[0032]A container of this invention is provided with the following.
Package body.
A septum carried out for 2 minutes opening inside of a package body for free passage near the lower part.
A gutter which said septum was separated for while and was connected to the space side.
A lid formed on said gutter.

[0033]namely, the time of ** maintenance with which ** maintenance will be ** got blocked very much easily if piping is in an inside of a main part -- with a piping crack -- it is said that it is cheap -- it is problematic.
[0034]In this invention, use space instead of piping, for example, it is made to overflow from an opening, and while it dissociated by a septum carries out hot water supply by a gutter. Even if a maintenance becomes very easy by this, it is moreover hard to get it blocked and it gets it blocked further, it can be made to usually recover by maintenance.
[0035]
[Embodiment of the Invention]Hereafter, an embodiment of the invention is described based on a drawing.
[0036]Drawing 1 is a figure showing the entire configuration of the metal distribution system concerning one embodiment of this invention.
[0037]As shown in the figure, the 1st factory 10 and 2nd factory 20 are established in the place distant via the public road 30.
[0038]Two or more dies casting machines 11 as the point of use are arranged at the 1st

factory 10. Each dies casting machine 11 molds the product of desired shape with injection molding, using the fused aluminum as raw material. The parts relevant to the engine of a car, etc. can be mentioned as the product. Of course, it does not matter even if it is the alloy which made the subject other metal, such as not only an aluminum alloy but magnesium, titanium, etc., as fused metal. Near each dies casting machine 11, the holding furnace (hand holding furnace) 12 which once stores the fused aluminum in front of a shot is arranged. Molten aluminum for two or more shots is stored by this holding furnace 12, and molten aluminum is poured into the dies casting machine 11 from the holding furnace 12 via Radl 13 or piping for every single shot. The temperature sensor (not shown) for detecting the temperature of the level detection sensor (not shown) which detects the oil level of the molten aluminum stored in the container, or molten aluminum is arranged in each holding furnace 12. The detection result by these sensors is transmitted to the operator control panel of each dies casting machine 11, or the central controlling part 16 of the 1st factory 10.

[0039]The acceptance stand 17 for receiving in the acceptance portion of the 1st factory 10 the container 100 mentioned later is arranged. The container 100 received on the acceptance stand 17 of the acceptance portion is delivered even to the predetermined dies casting machine 11 with the delivery van 18, and molten aluminum is supplied to the holding furnace 12 from the container 100. The container 100 which supply ended is again returned to the acceptance stand 17 of an acceptance portion with the delivery van 18.

[0040]The 1st furnace 19 for fusing aluminum and supplying the container 100 is formed in the 1st factory 10, and the container 100 to which molten aluminum was supplied at this 1st furnace 19 is also delivered even to the predetermined dies casting machine 11 with the delivery van 18.

[0041]When the addition of molten aluminum is needed for the 1st factory 10 in each dies casting machine 11, the indicator 15 which displays it is arranged. More specifically a peculiar number is shaken every dies casting machine 11, for example, the number is displayed on the indicator 15, and the number in the indicator 15 corresponding to the number of the dies casting machine 11 for which the addition of molten aluminum is needed lights up. Based on the display of this indicator 15, the dies casting machine 11 corresponding to that number carries the container 100 using the delivery van 18, and a worker supplies molten aluminum. Based on the detection result by a level detection sensor, the display in the indicator 15 is performed, when the central controlling part 16 controls.

[0042]The 2nd furnace 21 for fusing aluminum and supplying the container 100 is formed in the 2nd factory 20. Two or more sorts from which the container 100 differs in capacity, piping length, height, width, etc. are prepared. For example, according to the capacity of the holding furnace 12 in the dies casting machine 11 in the 1st factory 10, etc., there are two or more sorts from which capacity differs. However, of course, it does not matter even if the container 100 is unified into one kind and it standardizes it.

[0043]The container 100 with which molten aluminum was supplied by this 2nd furnace 21 is put on the track 32 for conveyance by the fork lift truck (not shown). The track 32 carries the container 100 through the public road 30 to near the acceptance stand 17 of the acceptance portion in the 1st factory 10, and these containers 100 are received by a fork lift truck (not shown), and are received in the stand 17. The container 100 of the empty in an acceptance portion is returned to the 2nd factory 20 by the track 32.
[0044]When the addition of molten aluminum is needed for the 2nd factory 20 in each dies casting machine 11 in the 1st factory 10, the indicator 22 which displays it is arranged. The composition of the indicator 22 is the same as that of the indicator 15 arranged in the 1st factory 10 almost. The display in the indicator 22 is performed when the central controlling part 16 in the 1st factory 10 controls, for example via the communication line 33. In the indicator 22 in the 2nd factory 20, Among the dies casting machines 11 which need supply of molten aluminum, from the 1st furnace 19 in the 1st factory 10, the dies casting machine 11 determined that molten aluminum is supplied is distinguished in the other dies casting machine 11, and is displayed. For example, the number corresponding to the dies casting machine 11 determined such blinks. What supplies molten aluminum from the 2nd factory 20 side accidentally to the dies casting machine 11 determined by this that molten aluminum is supplied from the 1st furnace 19 can be abolished. The data transmitted from the central controlling part 16 besides the above is also displayed on this indicator 22.
[0045]Next, operation of the metal distribution system constituted in this way is explained.
[0046]In the central controlling part 16, the quantity of molten aluminum in each holding furnace 12 is supervised via the level detection sensor formed in each holding furnace 12. When the necessity for supply of molten aluminum arises with a certain holding furnace 12 here, the central controlling part 16, "The peculiar number" of the holding furnace 12, the "temperature data" of the holding furnace 12 detected by the temperature sensor formed in the holding furnace 12, The "gestalt data" about the gestalt (it mentions later.) of the holding furnace 12, final "time information" whose molten aluminum is lost from the holding furnace 12, The "traffic data" of the public road 30, the "quantity data" of the molten aluminum demanded with the holding furnace 12, "atmospheric temperature data", etc. are transmitted to the 2nd factory 20 side via the communication line 33. These data is expressed to the indicator 22 as the 2nd factory 20. Just before molten aluminum disappears from the above-mentioned holding furnace 12 experientially based on these displayed data in a worker, the container 100 reaches the holding furnace 12, And the dispatch time of the container 100 from this 2nd factory 20 and the temperature at the time of dispatch of molten aluminum are determined that molten aluminum at that time will serve as a desired temperature. Or just before it downloads these data to a personal computer (not shown) and molten aluminum disappears from the above-mentioned holding furnace 12 using predetermined software, the container 100 reaches the holding furnace 12, And molten aluminum at that time presumes that the dispatch time of the container 100 from this 2nd factory 20 and the temperature at the time of dispatch of molten aluminum become a

desired temperature, and it may be made to display the time and temperature. Or temperature control of the 2nd furnace 21 may be automatically carried out with the presumed temperature. Based on the above "quantity data", it may determine also about the quantity of the molten aluminum which should be accommodated in the container 100.
[0047]If the track 32 which carried the container 100 at dispatch time leaves and it arrives at the 1st factory 10 through the public road 30, the container 100 will be received in the acceptance stand 17 of an acceptance portion from the track 32.
[0048]Then, the received container 100 is delivered even to the predetermined dies casting machine 11 with the delivery van 18 with the acceptance stand 17, and molten aluminum is supplied to the holding furnace 12 from the container 100.
[0049]As shown in drawing 2, in this example, the molten aluminum accommodated in the container 100 by sending out in the container 100 which had high pressure air sealed from the receiver tank 101 is breathed out from the piping 56, and is supplied in the holding furnace 12. In drawing 2, 103 is a pressurizing valve and 104 is a leak valve.
[0050]Here, the height of the holding furnace 12 has various kinds of things, and regulation of it is attained so that the tip of the piping 56 may serve as an optimal position on the holding furnace 12 according to the rising and falling mechanism provided in the delivery van 18. However, depending on the height of the holding furnace 12, it may be unable to correspond only by a rising and falling mechanism. Then, in this system, as "gestalt data" about the gestalt of the holding furnace 12, The data about the height of the holding furnace 12 or the distance to the holding furnace 12, etc. are beforehand sent to the 2nd factory 20 side, and the container 100 of the optimal gestalt, for example, the optimal height, is chosen and delivered based on this data in the 2nd factory 20 side. The container 100 of the optimal size may be chosen and delivered according to the quantity which should be supplied.
[0051]Next, the suitable container (pressure type molten-metal supply container) 100 for the system constituted in this way is explained based on drawing 3 and drawing 4. Drawing 3 is a sectional view of the container 100, and drawing 4 is the top view.
[0052]As for the container 100, the large lid 52 is arranged at the owner bottom at the upper opening 51 of the tubed main part 50. The flanges 53 and 54 are formed in the periphery of the main part 50 and the large lid 51, respectively, and the main part 50 and the large lid 51 are being fixed by fastening between these flanges with the bolt 55. As for the main part 50 or the large lid 51, the outside is metal and the inside is constituted by fire refractory material material and thermal insulation.
[0053]The piping fitting part 58 in which the channel 57 which is open for free passage for the piping 56 from main part 50 inside was established is formed in one place of the periphery of the main part 50, and the piping 56 is being fixed to it so that it may be open for free passage to the channel 57 of this piping fitting part 58. The piping 56 has gamma-like shape and, thereby, the end mouth 59 of the piping 56 has turned to the lower part. More specifically, about 10 degrees of end mouths 59 of the piping 56 lean as opposed to

the altitude. Thus, when the molten metal drawn from the end mouth 59 by giving an inclination flowed and falls to the server side, it decreases that a hot water drop scatters from the surface of hot water.

[0054]The hatch 62 of the above-mentioned large lid 52 for which the opening 60 was mostly formed in the center and the handle 61 was attached to the opening 60 is arranged. The hatch 62 is formed in the position somewhat higher than the large lid 52 upper surface. It is attached to one place of the periphery of the hatch 62 via the hinge 63 at the large lid 52. Thereby, opening and closing of the hatch 62 are enabled to the opening 60 of the large lid 52. The bolt 64 with the handle for fixing the hatch 62 to the large lid 52 is attached to two places of the periphery of the hatch 62 so that it may counter with the position to which this hinge 63 was attached. The hatch 62 will be fixed to the large lid 52 by shutting the opening 60 of the large lid 52 on the hatch 62, and rotating the bolt 64 with a handle. Counterrotation of the bolt 64 with a handle can be carried out, conclusion can be opened wide, and the hatch 62 can be opened from the opening 60 of the large lid 52. And where the hatch 62 is opened, maintenance of container 100 inside and insertion of the gas burner at the time of preheating are performed via the opening 60.

[0055]The breakthrough 65 for the internal pressure adjustment for performing the decompression and application of pressure in the container 100 is formed in the position [center / the center of the hatch 62, or] shifted for a while. The piping 66 for pressurization and decompression is connected to this breakthrough 65. This piping 66 was extended from the breakthrough 65 to the upper part, and it turned at it in predetermined height, and it has extended horizontally from there. The screw thread is cut in the surface of the insert portion to the breakthrough 65 of this piping 66, on the other hand, the screw thread is cut by the breakthrough 65, and, thereby, the piping 66 is fixed by a screw stop to the breakthrough 65.

[0056]Connection of the piping 67 for application of pressure or for decompression is attained at one side of this piping 66, the tank accumulated in the application-of-pressure gas and the pump for application of pressure are connected to piping for application of pressure, and the pump for decompression is connected to piping for decompression. And it is possible to introduce molten aluminum in the container 100 via the piping 56 and the channel 57 using a pressure differential with decompression, and derivation of molten aluminum to the outside of the container 100 is possible via the channel 57 and the piping 56 using a pressure differential by application of pressure. Oxidation of molten aluminum at the time of application of pressure can be more effectively prevented by using inert gas, for example, nitrogen gas, as an application-of-pressure gas.

[0057]According to this embodiment, since the above-mentioned piping 66 has extended horizontally while the breakthrough 65 for pressurization and decompression is formed in the hatch 62 of the large lid 52 mostly arranged in the center section, the work which connects the piping 67 for application of pressure or for decompression to the above-mentioned piping 66 can be done safely and easily. Since the piping 66 can be rotated by

small power to the breakthrough 65 when the piping 66 extends in this way, it is very small power about the immobilization of the piping 66 and removal by which the screw stop was carried out to the breakthrough 65, and it can carry out, without using a tool, for example.
[0058]The breakthrough 68 for pressure release is formed in the position which counters in the breakthrough 65 for the aforementioned pressurization and decompression in the position [center / of the hatch 62] shifted for a while, and a relief valve (a graphic display is omitted) is attached to the breakthrough 68 for pressure release. When the inside of the container 100 becomes more than a predetermined pressure thereby, for example, the inside of the container 100 is wide opened by atmospheric pressure from a viewpoint of safety.
[0059]The two breakthroughs 70 for surface sensors in which the two electrodes 69 as a surface sensor are inserted, respectively are arranged with the predetermined interval at the large lid 52. The electrode 69 is inserted in these breakthroughs 70, respectively. These electrodes 69 are arranged so that it may counter within the container 100, and each tip has extended to the almost same position as the maximum oil level of the molten metal for example, in the container 100. And it can be possible to detect the maximum oil level of the molten metal in the container 100 by monitoring the switch-on between the electrodes 69, and, thereby, the oversupply of the molten metal to the container 100 can be more certainly prevented now.
[0060]the leg (channel) 71 of length predetermined in the section mouth shape where the fork (a graphic display is omitted) of a fork lift truck is inserted in the pars-basilaris-ossis-occipitalis rear face of the main part 50, for example -- for example, two are arranged so that it may be parallel. As for the pars basilaris ossis occipitalis of the main part 50 inside, the whole inclines so that the channel 57 side may become low. Thereby, when deriving molten aluminum outside via the channel 57 and the piping 56 by application of pressure, the so-called remainder of hot water decreases. When leaning the container 100, for example at the time of a maintenance and deriving molten aluminum outside via the channel 57 and the piping 56, the angle which leans the container 100 can be made smaller and it becomes the thing excellent in safety or workability.
[0061]Thus, in the container 100 concerning this embodiment, since the breakthrough 65 for internal pressure adjustment was formed in the hatch 62 and the piping 66 for internal pressure adjustment is connected to the breakthrough 65, the adhesion of metal to the breakthrough 65 for [whenever it supplies molten metal in the container 100] internal pressure adjustment can be checked. Therefore, the piping 66 for using for internal pressure adjustment and **** of the breakthrough 65 can be prevented beforehand.
[0062]In the container 100 concerning this embodiment, the breakthrough 65 for internal pressure adjustment is formed in the hatch 62, And adhering to the piping 66 of the upper face part of the container 100 corresponding to a position with a degree small in comparison to which change and the drop of the oil level of molten aluminum scatter in the hatch 62 for molten aluminum to use for internal pressure adjustment since it is mostly

provided in the center, or the breakthrough 65 decreases. Therefore, the piping 66 for using for internal pressure adjustment and **** of the breakthrough 65 can be prevented.
[0063]In the container 100 concerning this embodiment, since the hatch 62 is formed in the upper face part of the large lid 52, the distance of the rear face of the hatch 62 and an oil level becomes long by the thickness of the large lid 52 compared with the distance of the rear face of the large lid 52, and an oil level. Therefore, a possibility that aluminum will adhere to the rear face of the hatch 62 in which the breakthrough 65 was formed becomes low, and the piping 66 for using for internal pressure adjustment and **** of the breakthrough 65 can be prevented.
[0064]Next, the distribution system from the 2nd furnace 21 in the 2nd factory 20 to the container 100 is explained based on drawing 5.
[0065]As shown in drawing 5, molten aluminum is stored in the 2nd furnace 21. The feed zone 21a is formed in this 2nd furnace 21, and the siphon 201 is inserted in this feed zone 21a. This siphon 201 is arranged so that an end mouth (tip part 201b of another side of the siphon 201) may appear frequently from the oil level of the aluminum to which melting of the feed zone 21a was carried out. That is, one tip part 201a of the siphon 201 extends to near the pars basilaris ossis occipitalis of the 2nd furnace 21, and the tip part 201b of another side of the siphon 201 is drawn from the feed zone 21a outside. The siphon 201 inclines fundamentally according to the maintaining structure 202, and is held. About 10 degrees leans to the altitude and the angle of inclination agrees with the inclination of the tip part of the piping 56 in the above-mentioned container 100. It is connected to the tip part of the piping 56 in the container 100, and it becomes easy by agreeing an inclination in this way to connect the tip part 201b of this siphon 201 with the tip part 201b of the siphon 201 and the tip part of the piping 56 in the container 100.
[0066]And the piping 67 connected to the pump 313 for decompression is connected to the piping 66. Next, the pump 313 is operated and the inside of the container 100 is decompressed. Thereby, the molten aluminum currently stored in the 2nd furnace 21 is introduced in the container 100 via the siphon 201 and the piping 56.
[0067]According to this embodiment, since he is trying to introduce the molten aluminum currently especially stored in the 2nd furnace 21 in this way in the container 100 via the siphon 201 and the piping 56, molten aluminum does not contact external air. Therefore, an oxide does not arise and the molten aluminum supplied using this system becomes what has dramatically good quality. The work for removing an oxide from the inside of the container 100 becomes unnecessary, and workability's improves.
[0068]Especially according to this embodiment, since the introduction of molten aluminum and the derivation of molten aluminum from the container 100 to the container 100 can be substantially performed only using the piping 56 and 312 of two, a system configuration can be made very simple. Since the opportunity for molten aluminum to contact the open air decreases sharply, generation of an oxide can be lost mostly.
[0069]Drawing 6 shows the manufacturing flow at the time of applying the above system to

an auto factory.
[0070]First, as shown in drawing 5, the molten aluminum currently stored in the 2nd furnace 21 is introduced in the container 100 via the siphon 201 and the piping 56 (Step 501). (****)
[0071]Next, as shown in drawing 1, the container 100 is conveyed from the 2nd factory 20 to the 1st factory 10 with the track 32 via the public road 30 (Step 502).
[0072]Next, at the 1st factory (point of use) 10, the container 100 is delivered even to the dies casting machine 11 for automobile engine manufacture with the delivery van 18, and molten aluminum is supplied to the holding furnace 12 from the container 100 (Step 503).
[0073]Next, in this dies casting machine 11, molding of the automobile engine using the molten aluminum stored by the holding furnace 12 is performed (Step 504).
[0074]And an assembly of a car is performed using the automobile engine and other parts which were molded in this way, and a car is completed (Step 505).
[0075]In this embodiment, since the engine of a car is a product made from aluminum which hardly contains an oxide as mentioned above, it is possible to manufacture the car which has an engine with sufficient performance and endurance.
[0076]Another embodiment of this invention is described.
[0077]Drawing 7 is a sectional view of the container concerning a 2nd embodiment of this invention. The state where it was made to incline is shown by the figure.
[0078]The container 2100 shown in the figure is provided with the following.
Package body 2110.
Piping 2130 allocated out of the package body 2110 from the position [center / 2111 / of the package body 2110] 2112 shifted.

[0079]The package body 2110 has the opening 2113 in the upper part, and it is equipped with the lid 2114 so that the opening 2113 may be plugged up.
[0080]The package body 2110 is provided with the following.
The 1st frame 2116 that constitutes the 1st space 2115, for example, consists of steel, such as SS400 (JIS).
The 2nd frame 2118 that consists of steel, such as SS400 (JIS), for example, it was allocated so that the 2nd space 117 might be constituted between the 1st frame 2116.
As for these frame materials, it is preferred to constitute from material with a small coefficient of linear expansion, and it is preferred that the difference of a coefficient of linear expansion with insulators, such as an axle-pin rake who constructs to a inner layer, adopts a small material. That the 1st frame and 2nd frame make the physical properties cooperate furthermore has chosen and adopted the material which has the same physical properties preferably here.
[0081]The locking members 2119 and 2119 of the shape of a character of one pair of mouths in which the fork of a fork lift truck is inserted are attached to the pars basilaris ossis occipitalis of the package body 2110.
[0082]The opening 2121 for [the] pouring the molten metal 2120 of metal, such as

aluminum, into main slippage into the package body 2110 mostly is formed in the lid 2114, The child lid 2122 is fixed to the opening 2121 by the fastener which the child lid 2122 was pivoted by the opening 2121, and omitted the graphic display.
[0083]The feed port 2123 for introducing the gas for application of pressure into the 1st space 2115 in the package body 2110 from the booster pump which omitted the graphic display is established in the lid 2114. Oxidation of the molten metal 2120 can be prevented by using inactive gas, such as nitrogen gas, as the above-mentioned gas.
[0084]The piping 2130 allocated out of the package body 2110 from the position [center / 2111 / of the package body 2110] 2112 shifted is attached to the lid 2114. The lower end 2131 of the piping 2130 is located to near the pars basilaris ossis occipitalis in the package body 2110. The mechanism whose opening and closing of this lower end 2131 are enabled may be formed. Thereby, when a container falls, it becomes possible to prevent hot water from flowing out. The piping 2130 is provided with the following.
The inclined part 2132 which inclines 5 degrees - about 10 degrees towards the upper part out of the package body 2110.
The discharge part 2133 which is turned caudad and carries out an opening.

[0085]Here, in the case of a container [80 cm in inside diameter], the interval of the center 2111 of the package body 2110 and the above-mentioned gap position 2112 is about 30 cm, for example. Even if this displacement is larger and it is small, it can acquire the same effect.
[0086]In such a container 2100, first, according to a horizontal state, an application-of-pressure gas is introduced from the feed port 2123, and the molten metal 2120 in the package body 2110 is fed outside from the piping 2130. Then, it is made to incline in the piping 2130 side by a fork lift truck, as shown in drawing 7, and the remaining molten metals 2120 are fed outside from the piping 2130.
[0087]In the container 2100 of this embodiment constituted in this way. Since the piping 2130 has shifted from the center of the package body 2110, if it returns horizontally after the displacement to the oil level in the package body 2110 becomes large and breathes out a molten metal in this state, when it leans, space will be made between the lower end 2131 of the piping 2130, and the 2120th page of a molten metal, and pipe clogging will be prevented.
[0088]Drawing 8 is a sectional view of the container concerning a 3rd embodiment of this invention. The same numerals are given to the same component as the component already illustrated by following embodiments, and explanation is omitted.
[0089]In this container 2200, at least one passage (piping) 2210 which connects the 1st space 2115 and 2nd space 2117 is formed.
[0090]The pressurizing mechanism 2220 and the leak valve 2230 are attached to the 2nd space 2117.
[0091]In the pressurizing mechanism 2220, application-of-pressure air is introduced into the

2nd space 2117 from the air tank 2223 via 2222 in the pressurizing valve 2221 and a reducing valve. moreover -- the pressurizing mechanism 2220 -- pressure KONTORA 2224 -- attachment ******.

[0092]It is also possible to replace with the pressurizing mechanism 2220 and to connect a vacuum pump.

[0093]If the 2nd space 2117 is lengthened to the vacuum, it will be kept warm, and the fall of the insulation efficiency by aging of thermal insulation can be compensated with the container 2200 constituted in this way. For example, what is necessary is just to raise a degree of vacuum according to aging.

[0094]In the container 2200 constituted in this way, if the 1st space 2115 is pressurized from the between [the 2nd empty 2116] side via the passage 2210, after a feeding gas is preheated, it will be supplied to the inside of a container (the 1st space 2115). Therefore, the temperature fall of a molten metal can be suppressed small. In particular, in a feeding culmination, it is easy to generate the intermittent regurgitation of a molten metal and a gas, the temperature of a molten metal is taken by the feeding gas in that case, and viscosity becomes large. Therefore, by preheating a feeding gas, the temperature fall of a molten metal can be controlled and pipe clogging can be prevented effectively. In addition, safe stopping hot water supply can also be performed and time which stopping hot water supply takes can be shortened.

[0095]In the container 2200 constituted in this way, by it being made to perform leak of the 1st space 2115 by the leak valve 2230 from the 2nd space 2117 side via the passage 2210, after cooling high temperature gas to some extent, it is leaking from the leak valve 2230. Therefore, the thermal load concerning the leak valve 2230 can be reduced, and improvement in reliability of a device and reinforcement can be attained.

[0096]Drawing 9 is a sectional view of the container concerning a 4th embodiment of this invention.

[0097]In the container 2300 shown in the figure, the pressurizing mechanism 2220 is connected to the 1st space 2115, and the reduced pressure control 2310 is connected to the 2nd space 2117. In the reduced pressure control 2310, the vacuum pump 2312 is connected to the 2nd space 2117, for example via the vacuum valve 2311, and the vacuum meter 2313 and the leak valve 2314 are inserted among them.

[0098]The leak valve 2320 as the 2nd valve is inserted in the passage 2210 which connects the 1st space 2115 and 2nd space 2117, and also the leak valve 2321 as the 1st valve is connected into the package body.

[0099]In the container 2300 of such composition, improvement in the reliability of the time reduction which stopping-hot-water-supply operation takes, or stop operation can be aimed at. That is, the 2nd space 2117 is decompressed, at the time of stopping hot water supply, opens wide the leak valve 2320 as the 2nd valve of the occasion that opens the leak valve 2321 as the 1st valve wide first, and carries out ** pressure of the inside of the 1st space 2115, and makes the 1st space 2115 negative pressure. Thereby, pull back by the side of

perfect stopping hot water supply and also the container of the molten metal in piping can be performed.

[0100]Drawing 10 is a sectional view of the container concerning a 5th embodiment of this invention.

[0101]In the container 2400 shown in the figure, the piping 2420 which has an inclination which goes up is connected near the package body 2410 pars basilaris ossis occipitalis. The other end of the piping 2420 is prolonged to the position higher than the container 2400 at least.

[0102]Drawing 11 is a sectional view of the container concerning a 6th embodiment of this invention.

[0103]In the container 2500 shown in the figure, the septum 2520 carried out for 2 minutes opening the inside of the package body 2510 for free passage near the lower part and the gutter 2540 which while was divided and was connected to the space 2530 side by the septum 2520 are provided. The pressurizing mechanism 2220 is connected to the space 2531 of another side. The lid 2541 is formed in the upper part of the bucket part 2540.

[0104]In the container 2500 of this embodiment, if the inside of a container is pressurized according to the pressurizing mechanism 2220, the hot water in a container will be breathed out outside via the gutter 2540.

[0105]namely, the time of ** maintenance with which ** maintenance will be ** got blocked very much easily if piping is in the inside of a main part -- with a piping crack -- it is said that it is cheap -- it is problematic.

[0106]On the other hand, in the container 2500 of this embodiment, use the space 2530 instead of piping, for example, it is made to overflow from the opening 2532, and while it dissociated by the septum 2520 carries out hot water supply by the gutter 2540. Even if a maintenance becomes very easy by this, it is moreover hard to get it blocked and it gets it blocked further, it can be made to usually recover by maintenance.

[0107]Drawing 12 is a sectional view of the container concerning a 7th embodiment of this invention.

[0108]The container 2600 shown in the figure removes the lid 2541 arranged in the upper part of the bucket part 2540 in the container shown in drawing 11.

[0109]

[Effect of the Invention]As explained above, according to this invention, piping for using for internal pressure adjustment and **** of a hole can be prevented.

[Translation done.]

* NOTICES *

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TECHNICAL FIELD

[Field of the Invention]This invention relates to the container for molten-metal supply used for conveyance of the aluminum fused, for example.

[Translation done.]

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PRIOR ART

[Description of the Prior Art]At the factory where molding of aluminum is performed using many dies casting machines, supply of an aluminum material is received from the outside not only of the inside of a factory but a factory in many cases. In this case, supplying material with the state where conveyed the ladle which accommodated aluminum in the state where it fused to the factory by the side of molding, and it was fused from the factory by the side of material supplying to each dies casting machine is performed.
[0003]It is structure like a teapot so to speak for which piping for supply was attached to the side attachment wall of the package body in which molten metal is stored, and, as for the ladle used from the former, supplying molten metal to the holding furnace by the side of molding from piping is performed by leaning this ladle.

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EFFECT OF THE INVENTION

[Effect of the Invention]As explained above, according to this invention, piping for using for internal pressure adjustment and **** of a hole can be prevented.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention]However, in such a ladle, the inclination of the ladle is performed using the fork lift truck, for example, and such work was not necessarily able to be said as a safe thing. Since it was necessary to provide a moving mechanism in a fork lift truck in order to make a ladle incline, composition became special and the technical problem that the worker who became skillful in operation of a fork lift truck for still such operation was needed occurred.
[0005]Therefore, this invention persons have advocated the distribution system of the molten metal using a pressure differential. This system provides piping for deriving molten metal outside at the sealed container, connects piping for supplying an application-of-pressure gas to this container further, and is drawing molten metal from piping for metal derivation to the holding furnace by the side of molding of the exterior by pressurizing the inside of a container.
[0006]However, in the container of the above-mentioned composition, there is a problem of getting blocked easily piping for application-of-pressure gas supplies. In particular, in the above-mentioned system, since a container is carried in a track and carried from a factory via a public road at other factories, it shakes, and there are many things, and, for this reason, the oil level of the molten metal in a container inclines, or a drop scatters within a container, and these adhere to piping for application-of-pressure gas supplies, for example. And in such adhesion, piping **** has occurred, for example in the repeated thing.
[0007]In view of the above situation, the main purpose of this invention is to provide the container for molten-metal supply which can prevent piping for using for internal pressure adjustment, and **** of a hole.

[Translation done.]

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MEANS

[Means for Solving the Problem]In order to solve this technical problem, a molten-metal distribution system concerning a main viewpoint of this invention, Inside and outside of a container which can accommodate molten metal, and said container are opened for free passage, and it is provided in a channel which can be circulated in said molten metal, and an upper face part of said container so that opening and closing are possible, and a hatch in which a breakthrough for internal pressure adjustment which opens inside and outside of said container for free passage was provided is provided.
[0009]Usually, it precedes supplying molten metal in this container, and a container is preheated with warmers, such as a gas burner. This preheating is performed by opening a hatch and inserting some warmers into a container. Therefore, whenever a hatch supplies molten metal in a container, it can be opened. In this invention, since a breakthrough for internal pressure adjustment is provided in such a hatch, adhesion of metal to a breakthrough for [whenever it supplies molten metal in a container] internal pressure adjustment can be checked. And what is necessary is just to remove it each time, when metal has adhered, for example to a breakthrough. Therefore, in this invention, piping for using for internal pressure adjustment and **** of a hole can be prevented beforehand. This hatch is provided with sealing members, such as packing for securing airtightness for an inside of a container, in this invention. As for packing, what has heat resistance, such as a thing made from silicon, is preferred.
[0010]As for a container for molten-metal supply of this invention, said hatch is characterized by a thing of an upper face part of said container mostly established in the center.
[0011]When a container shakes, and an oil level inclines or a drop scatters, a degree to which change and a drop of an oil level scatter more in a direction near a center section is smaller than near the periphery in a container. In this invention, a breakthrough for internal pressure adjustment is provided in a hatch, and adhering to piping and a hole of an upper face part of a container corresponding to a position with a small degree to which change and a drop of an oil level moreover scatter as mentioned above in the hatch for metal to

use for internal pressure adjustment since it is mostly provided in the center decreases. Therefore, in this invention, piping for using for internal pressure adjustment and **** of a hole can be prevented.

[0012]A container for molten-metal supply of this invention is attached to said breakthrough, it projects towards the upper part from an upper face part of said container, and it is horizontally bent in a position of predetermined height, and piping drawn horizontally is provided further.

[0013]In a system for which a container concerning this invention is used, piping from a tank for application-of-pressure gas supplies or a pump for decompression is connected to piping attached to a breakthrough, for example. Such connection is made, whenever it introduces molten metal in a container, or whenever it derives molten metal from the inside of a container. On the other hand, a container with which molten metal is stored is very an elevated temperature, and workability is in a bad state. In a container concerning this invention, a breakthrough for internal pressure adjustment is the composition on the upper surface of a container which exists in the center mostly, and if piping extended up as it is was attached, the workability of connection during the above piping is dramatically bad. On the other hand, a worker can work safely and easily by extending a hand to a connection point during piping by having composition which piping derives horizontally as mentioned above, for example.

[0014]A container for molten-metal supply of this invention is screwed on removable [to said breakthrough] in said piping.

[0015]It becomes possible with constituting from this invention so that piping may be screwed on removable to a breakthrough to detach and attach piping from a breakthrough depending on how like a spanner to use so to speak in the piping itself currently drawn horizontally. Therefore, attachment and detachment of piping can be performed easily, without using a special tool etc. This becomes possible to often check plugging condition of piping, for example, and **** of piping for using for internal pressure adjustment can be prevented beforehand.

[0016]This invention is characterized by a container for molten-metal supply concerning another viewpoint comprising the following.

A container which can accommodate molten metal, opens inside and outside for free passage, and has a breakthrough for internal pressure adjustment of an upper face part mostly provided in a main position.

A channel which inside and outside of said container are opened for free passage and can be circulated in said molten metal.

[0017]As mentioned above, when a container shakes, and an oil level inclines or a drop scatters, a degree to which change and a drop of an oil level scatter more in a direction near a center section is smaller than near the periphery in a container. In this invention, adhering to piping of an upper face part of a container corresponding to a position with a

small degree to which change and a drop of an oil level scatter in this way in a breakthrough for internal pressure adjustment for metal to use for internal pressure adjustment since it is mostly provided in the center, or a hole decreases. Therefore, in this invention, piping for using for internal pressure adjustment and **** of a hole can be prevented.

[0018]As for a container for molten-metal supply of this invention, said container possesses further a hatch of an upper face part of the container concerned mostly provided in the central part, and said breakthrough is provided in said hatch.

[0019]As mentioned above, it usually precedes supplying molten metal in a container, and a container is preheated with a gas burner. This preheating is performed by opening a hatch and inserting a gas burner into a container. Therefore, whenever a hatch supplies molten metal in a container, it can be opened. In this invention, since a breakthrough for internal pressure adjustment is provided in such a hatch, adhesion of metal to a breakthrough for [whenever it supplies molten metal in a container] internal pressure adjustment can be checked. And what is necessary is just to remove it each time, when metal has adhered, for example to a breakthrough. Therefore, in this invention, piping for using for internal pressure adjustment and **** of a hole can be prevented beforehand.

[0020]A container for molten-metal supply of this invention can be attached to said breakthrough, it projects towards the upper part from an upper face part of said container, and it is horizontally bent in a position of predetermined height, and piping drawn horizontally is provided further.

[0021]A container for molten-metal supply concerning another viewpoint of this invention, A container which can accommodate molten metal and has the 1st opening in the upper part, A channel which inside and outside of said container are opened for free passage and can be circulated in said molten metal, A hatch in which it has been arranged fixed so that the 1st opening of said container may be covered, and was provided in an upper face part of a lid which has the 2nd opening of a byway rather than said 1st opening in the center mostly, and said lid so that opening and closing were possible, and a breakthrough for internal pressure adjustment which opens inside and outside of said container for free passage was provided is provided.

[0022]In this invention, since a breakthrough for internal pressure adjustment is provided in such a hatch, adhesion of metal to a breakthrough for [whenever it supplies molten metal in a container] internal pressure adjustment can be checked. Therefore, in this invention, piping for using for internal pressure adjustment and **** of a hole can be prevented beforehand. In this invention, a breakthrough for internal pressure adjustment is provided in a hatch, and adhering to piping and a hole of an upper face part of a container corresponding to a position with a small degree to which change and a drop of an oil level moreover scatter as mentioned above in the hatch for metal to use for internal pressure adjustment since it is mostly provided in the center decreases. Therefore, in this invention, piping for using for internal pressure adjustment and **** of a hole can be prevented. In this

invention, since a hatch is provided in an upper face part of a lid, distance of a rear face of a hatch and an oil level becomes long by thickness of a lid compared with distance of a rear face of a lid, and an oil level. Therefore, a possibility that metal will adhere to a rear face of a hatch in which a breakthrough was provided becomes low. Therefore, in this invention, piping for using for internal pressure adjustment and **** of a hole can be prevented.
[0023]You may make it provide a package body and piping allocated out of a package body from position [center / of said package body] shifted as the above-mentioned container.
[0024]To getting it blocked, shortly after piping has been soaked in a molten metal within a container, in this invention. Since piping has shifted from the center of a package body, if it returns horizontally after displacement to an oil level in a container becomes large and breathes out a molten metal in this state, when it leans, space will be made between a piping lower end and a melt surface, and pipe clogging will be prevented.
[0025]A container of this invention possesses at least one passage which connects the 1st frame that constitutes the 1st space, the 2nd frame allocated so that the 2nd space might be constituted between said 1st frame, and said 1st space and said 2nd space.
[0026]If the 2nd space is lengthened to a vacuum, it will be kept warm, and a fall of insulation efficiency by aging of thermal insulation can be compensated with this invention. If the 1st space is pressurized from the 2nd space side via a passage, after a feeding gas is preheated, it will be supplied to an inside of a container. Therefore, a temperature fall of a molten metal can be suppressed small. In particular, in a feeding culmination, it is easy to generate intermittent regurgitation of a molten metal and a gas, temperature of a molten metal is taken by feeding gas in that case, and viscosity becomes large. Therefore, by preheating a feeding gas, a temperature fall of a molten metal can be controlled and pipe clogging can be prevented effectively. In addition, safe stopping hot water supply can also be performed and time which stopping hot water supply takes can be shortened.
[0027]In this invention, leak of the 1st space can be performed from the 2nd space side via a passage. Although a gas of the 1st space pressurized at the time of a feeding stop is leaked and ** pressure is carried out to ordinary pressure, then, since a gas of the 1st space coexists with a molten metal, it is very an elevated temperature, and if this high temperature gas was leaked directly, its leak valve will be hurt. On the other hand, by performing leak of the 1st space from the 2nd space side via a passage, thermal load concerning a leak valve can be reduced and improvement in reliability of a device and reinforcement can be attained.
[0028]A container of this invention is provided with the following.
The 1st frame that constitutes the 1st space.
The 2nd frame allocated so that the 2nd space might be constituted between said 1st frame.
At least one passage which connects said 1st space and said 2nd space.
The 1st valve connected in said package body, and the 2nd valve of ** inserted on said passage.

[0029]In this invention, improvement in the reliability of time reduction which stopping-hot-water-supply operation takes, or stop operation can be aimed at. That is, the 2nd space is decompressed, at the time of stopping hot water supply, opens wide the 2nd valve of an occasion that opens the 1st valve wide first and carries out ** pressure of the inside of the 1st space, and makes the 1st space negative pressure. Thereby, pull back by the side of perfect stopping hot water supply and also a container of a molten metal in piping can be performed.
[0030]A container of this invention is provided with the following.
Package body.
Piping which has an inclination which is connected near a package body pars basilaris ossis occipitalis, and goes up at least.

[0031]A container of this invention is provided with the following.
Package body.
A septum carried out for 2 minutes opening inside of a package body for free passage near the lower part.
A gutter which said septum was divided for while and was connected to the space side.

[0032]A container of this invention is provided with the following.
Package body.
A septum carried out for 2 minutes opening inside of a package body for free passage near the lower part.
A gutter which said septum was separated for while and was connected to the space side.
A lid formed on said gutter.

[0033]namely, the time of ** maintenance with which ** maintenance will be ** got blocked very much easily if piping is in an inside of a main part -- with a piping crack -- it is said that it is cheap -- it is problematic.
[0034]In this invention, use space instead of piping, for example, it is made to overflow from an opening, and while it dissociated by a septum carries out hot water supply by a gutter. Even if a maintenance becomes very easy by this, it is moreover hard to get it blocked and it gets it blocked further, it can be made to usually recover by maintenance.
[0035]
[Embodiment of the Invention]Hereafter, an embodiment of the invention is described based on a drawing.
[0036]Drawing 1 is a figure showing the entire configuration of the metal distribution system concerning one embodiment of this invention.
[0037]As shown in the figure, the 1st factory 10 and 2nd factory 20 are established in the place distant via the public road 30.

[0038]Two or more dies casting machines 11 as the point of use are arranged at the 1st factory 10. Each dies casting machine 11 molds the product of desired shape with injection molding, using the fused aluminum as raw material. The parts relevant to the engine of a car, etc. can be mentioned as the product. Of course, it does not matter even if it is the alloy which made the subject other metal, such as not only an aluminum alloy but magnesium, titanium, etc., as fused metal. Near each dies casting machine 11, the holding furnace (hand holding furnace) 12 which once stores the fused aluminum in front of a shot is arranged. Molten aluminum for two or more shots is stored by this holding furnace 12, and molten aluminum is poured into the dies casting machine 11 from the holding furnace 12 via Radl 13 or piping for every single shot. The temperature sensor (not shown) for detecting the temperature of the level detection sensor (not shown) which detects the oil level of the molten aluminum stored in the container, or molten aluminum is arranged in each holding furnace 12. The detection result by these sensors is transmitted to the operator control panel of each dies casting machine 11, or the central controlling part 16 of the 1st factory 10.

[0039]The acceptance stand 17 for receiving in the acceptance portion of the 1st factory 10 the container 100 mentioned later is arranged. The container 100 received on the acceptance stand 17 of the acceptance portion is delivered even to the predetermined dies casting machine 11 with the delivery van 18, and molten aluminum is supplied to the holding furnace 12 from the container 100. The container 100 which supply ended is again returned to the acceptance stand 17 of an acceptance portion with the delivery van 18.

[0040]The 1st furnace 19 for fusing aluminum and supplying the container 100 is formed in the 1st factory 10, and the container 100 to which molten aluminum was supplied at this 1st furnace 19 is also delivered even to the predetermined dies casting machine 11 with the delivery van 18.

[0041]When the addition of molten aluminum is needed for the 1st factory 10 in each dies casting machine 11, the indicator 15 which displays it is arranged. More specifically a peculiar number is shaken every dies casting machine 11, for example, the number is displayed on the indicator 15, and the number in the indicator 15 corresponding to the number of the dies casting machine 11 for which the addition of molten aluminum is needed lights up. Based on the display of this indicator 15, the dies casting machine 11 corresponding to that number carries the container 100 using the delivery van 18, and a worker supplies molten aluminum. Based on the detection result by a level detection sensor, the display in the indicator 15 is performed, when the central controlling part 16 controls.

[0042]The 2nd furnace 21 for fusing aluminum and supplying the container 100 is formed in the 2nd factory 20. Two or more sorts from which the container 100 differs in capacity, piping length, height, width, etc. are prepared. For example, according to the capacity of the holding furnace 12 in the dies casting machine 11 in the 1st factory 10, etc., there are two or more sorts from which capacity differs. However, of course, it does not matter even if the

container 100 is unified into one kind and it standardizes it.
[0043]The container 100 with which molten aluminum was supplied by this 2nd furnace 21 is put on the track 32 for conveyance by the fork lift truck (not shown). The track 32 carries the container 100 through the public road 30 to near the acceptance stand 17 of the acceptance portion in the 1st factory 10, and these containers 100 are received by a fork lift truck (not shown), and are received in the stand 17. The container 100 of the empty in an acceptance portion is returned to the 2nd factory 20 by the track 32.
[0044]When the addition of molten aluminum is needed for the 2nd factory 20 in each dies casting machine 11 in the 1st factory 10, the indicator 22 which displays it is arranged. The composition of the indicator 22 is the same as that of the indicator 15 arranged in the 1st factory 10 almost. The display in the indicator 22 is performed when the central controlling part 16 in the 1st factory 10 controls, for example via the communication line 33. In the indicator 22 in the 2nd factory 20, Among the dies casting machines 11 which need supply of molten aluminum, from the 1st furnace 19 in the 1st factory 10, the dies casting machine 11 determined that molten aluminum is supplied is distinguished in the other dies casting machine 11, and is displayed. For example, the number corresponding to the dies casting machine 11 determined such blinks. What supplies molten aluminum from the 2nd factory 20 side accidentally to the dies casting machine 11 determined by this that molten aluminum is supplied from the 1st furnace 19 can be abolished. The data transmitted from the central controlling part 16 besides the above is also displayed on this indicator 22.
[0045]Next, operation of the metal distribution system constituted in this way is explained.
[0046]In the central controlling part 16, the quantity of molten aluminum in each holding furnace 12 is supervised via the level detection sensor formed in each holding furnace 12. When the necessity for supply of molten aluminum arises with a certain holding furnace 12 here, the central controlling part 16, "The peculiar number" of the holding furnace 12, the "temperature data" of the holding furnace 12 detected by the temperature sensor formed in the holding furnace 12, The "gestalt data" about the gestalt (it mentions later.) of the holding furnace 12, final "time information" whose molten aluminum is lost from the holding furnace 12, The "traffic data" of the public road 30, the "quantity data" of the molten aluminum demanded with the holding furnace 12, "atmospheric temperature data", etc. are transmitted to the 2nd factory 20 side via the communication line 33. These data is expressed to the indicator 22 as the 2nd factory 20. Just before molten aluminum disappears from the above-mentioned holding furnace 12 experientially based on these displayed data in a worker, the container 100 reaches the holding furnace 12, And the dispatch time of the container 100 from this 2nd factory 20 and the temperature at the time of dispatch of molten aluminum are determined that molten aluminum at that time will serve as a desired temperature. Or just before it downloads these data to a personal computer (not shown) and molten aluminum disappears from the above-mentioned holding furnace 12 using predetermined software, the container 100 reaches the holding furnace 12, And molten aluminum at that time presumes that the dispatch time of the container 100 from this

2nd factory 20 and the temperature at the time of dispatch of molten aluminum become a desired temperature, and it may be made to display the time and temperature. Or temperature control of the 2nd furnace 21 may be automatically carried out with the presumed temperature. Based on the above "quantity data", it may determine also about the quantity of the molten aluminum which should be accommodated in the container 100.

[0047]If the track 32 which carried the container 100 at dispatch time leaves and it arrives at the 1st factory 10 through the public road 30, the container 100 will be received in the acceptance stand 17 of an acceptance portion from the track 32.

[0048]Then, the received container 100 is delivered even to the predetermined dies casting machine 11 with the delivery van 18 with the acceptance stand 17, and molten aluminum is supplied to the holding furnace 12 from the container 100.

[0049]As shown in drawing 2, in this example, the molten aluminum accommodated in the container 100 by sending out in the container 100 which had high pressure air sealed from the receiver tank 101 is breathed out from the piping 56, and is supplied in the holding furnace 12. In drawing 2, 103 is a pressurizing valve and 104 is a leak valve.

[0050]Here, the height of the holding furnace 12 has various kinds of things, and regulation of it is attained so that the tip of the piping 56 may serve as an optimal position on the holding furnace 12 according to the rising and falling mechanism provided in the delivery van 18. However, depending on the height of the holding furnace 12, it may be unable to correspond only by a rising and falling mechanism. Then, in this system, as "gestalt data" about the gestalt of the holding furnace 12, The data about the height of the holding furnace 12 or the distance to the holding furnace 12, etc. are beforehand sent to the 2nd factory 20 side, and the container 100 of the optimal gestalt, for example, the optimal height, is chosen and delivered based on this data in the 2nd factory 20 side. The container 100 of the optimal size may be chosen and delivered according to the quantity which should be supplied.

[0051]Next, the suitable container (pressure type molten-metal supply container) 100 for the system constituted in this way is explained based on drawing 3 and drawing 4. Drawing 3 is a sectional view of the container 100, and drawing 4 is the top view.

[0052]As for the container 100, the large lid 52 is arranged at the owner bottom at the upper opening 51 of the tubed main part 50. The flanges 53 and 54 are formed in the periphery of the main part 50 and the large lid 51, respectively, and the main part 50 and the large lid 51 are being fixed by fastening between these flanges with the bolt 55. As for the main part 50 or the large lid 51, the outside is metal and the inside is constituted by fire refractory material material and thermal insulation.

[0053]The piping fitting part 58 in which the channel 57 which is open for free passage for the piping 56 from main part 50 inside was established is formed in one place of the periphery of the main part 50, and the piping 56 is being fixed to it so that it may be open for free passage to the channel 57 of this piping fitting part 58. The piping 56 has gamma-like shape and, thereby, the end mouth 59 of the piping 56 has turned to the lower part.

More specifically, about 10 degrees of end mouths 59 of the piping 56 lean as opposed to the altitude. Thus, when the molten metal drawn from the end mouth 59 by giving an inclination flowed and falls to the server side, it decreases that a hot water drop scatters from the surface of hot water.

[0054]The hatch 62 of the above-mentioned large lid 52 for which the opening 60 was mostly formed in the center and the handle 61 was attached to the opening 60 is arranged. The hatch 62 is formed in the position somewhat higher than the large lid 52 upper surface. It is attached to one place of the periphery of the hatch 62 via the hinge 63 at the large lid 52. Thereby, opening and closing of the hatch 62 are enabled to the opening 60 of the large lid 52. The bolt 64 with the handle for fixing the hatch 62 to the large lid 52 is attached to two places of the periphery of the hatch 62 so that it may counter with the position to which this hinge 63 was attached. The hatch 62 will be fixed to the large lid 52 by shutting the opening 60 of the large lid 52 on the hatch 62, and rotating the bolt 64 with a handle. Counterrotation of the bolt 64 with a handle can be carried out, conclusion can be opened wide, and the hatch 62 can be opened from the opening 60 of the large lid 52. And where the hatch 62 is opened, maintenance of container 100 inside and insertion of the gas burner at the time of preheating are performed via the opening 60.

[0055]The breakthrough 65 for the internal pressure adjustment for performing the decompression and application of pressure in the container 100 is formed in the position [center / the center of the hatch 62, or] shifted for a while. The piping 66 for pressurization and decompression is connected to this breakthrough 65. This piping 66 was extended from the breakthrough 65 to the upper part, and it turned at it in predetermined height, and it has extended horizontally from there. The screw thread is cut in the surface of the insert portion to the breakthrough 65 of this piping 66, on the other hand, the screw thread is cut by the breakthrough 65, and, thereby, the piping 66 is fixed by a screw stop to the breakthrough 65.

[0056]Connection of the piping 67 for application of pressure or for decompression is attained at one side of this piping 66, the tank accumulated in the application-of-pressure gas and the pump for application of pressure are connected to piping for application of pressure, and the pump for decompression is connected to piping for decompression. And it is possible to introduce molten aluminum in the container 100 via the piping 56 and the channel 57 using a pressure differential with decompression, and derivation of molten aluminum to the outside of the container 100 is possible via the channel 57 and the piping 56 using a pressure differential by application of pressure. Oxidation of molten aluminum at the time of application of pressure can be more effectively prevented by using inert gas, for example, nitrogen gas, as an application-of-pressure gas.

[0057]According to this embodiment, since the above-mentioned piping 66 has extended horizontally while the breakthrough 65 for pressurization and decompression is formed in the hatch 62 of the large lid 52 mostly arranged in the center section, the work which connects the piping 67 for application of pressure or for decompression to the above-

mentioned piping 66 can be done safely and easily. Since the piping 66 can be rotated by small power to the breakthrough 65 when the piping 66 extends in this way, it is very small power about the immobilization of the piping 66 and removal by which the screw stop was carried out to the breakthrough 65, and it can carry out, without using a tool, for example.
[0058]The breakthrough 68 for pressure release is formed in the position which counters in the breakthrough 65 for the aforementioned pressurization and decompression in the position [center / of the hatch 62] shifted for a while, and a relief valve (a graphic display is omitted) is attached to the breakthrough 68 for pressure release. When the inside of the container 100 becomes more than a predetermined pressure thereby, for example, the inside of the container 100 is wide opened by atmospheric pressure from a viewpoint of safety.
[0059]The two breakthroughs 70 for surface sensors in which the two electrodes 69 as a surface sensor are inserted, respectively are arranged with the predetermined interval at the large lid 52. The electrode 69 is inserted in these breakthroughs 70, respectively. These electrodes 69 are arranged so that it may counter within the container 100, and each tip has extended to the almost same position as the maximum oil level of the molten metal for example, in the container 100. And it can be possible to detect the maximum oil level of the molten metal in the container 100 by monitoring the switch-on between the electrodes 69, and, thereby, the oversupply of the molten metal to the container 100 can be more certainly prevented now.
[0060]the leg (channel) 71 of length predetermined in the section mouth shape where the fork (a graphic display is omitted) of a fork lift truck is inserted in the pars-basilaris-ossis-occipitalis rear face of the main part 50, for example -- for example, two are arranged so that it may be parallel. As for the pars basilaris ossis occipitalis of the main part 50 inside, the whole inclines so that the channel 57 side may become low. Thereby, when deriving molten aluminum outside via the channel 57 and the piping 56 by application of pressure, the so-called remainder of hot water decreases. When leaning the container 100, for example at the time of a maintenance and deriving molten aluminum outside via the channel 57 and the piping 56, the angle which leans the container 100 can be made smaller and it becomes the thing excellent in safety or workability.
[0061]Thus, in the container 100 concerning this embodiment, since the breakthrough 65 for internal pressure adjustment was formed in the hatch 62 and the piping 66 for internal pressure adjustment is connected to the breakthrough 65, the adhesion of metal to the breakthrough 65 for [whenever it supplies molten metal in the container 100] internal pressure adjustment can be checked. Therefore, the piping 66 for using for internal pressure adjustment and **** of the breakthrough 65 can be prevented beforehand.
[0062]In the container 100 concerning this embodiment, the breakthrough 65 for internal pressure adjustment is formed in the hatch 62, And adhering to the piping 66 of the upper face part of the container 100 corresponding to a position with a degree small in comparison to which change and the drop of the oil level of molten aluminum scatter in the

hatch 62 for molten aluminum to use for internal pressure adjustment since it is mostly provided in the center, or the breakthrough 65 decreases. Therefore, the piping 66 for using for internal pressure adjustment and **** of the breakthrough 65 can be prevented.
[0063]In the container 100 concerning this embodiment, since the hatch 62 is formed in the upper face part of the large lid 52, the distance of the rear face of the hatch 62 and an oil level becomes long by the thickness of the large lid 52 compared with the distance of the rear face of the large lid 52, and an oil level. Therefore, a possibility that aluminum will adhere to the rear face of the hatch 62 in which the breakthrough 65 was formed becomes low, and the piping 66 for using for internal pressure adjustment and **** of the breakthrough 65 can be prevented.
[0064]Next, the distribution system from the 2nd furnace 21 in the 2nd factory 20 to the container 100 is explained based on drawing 5.
[0065]As shown in drawing 5, molten aluminum is stored in the 2nd furnace 21. The feed zone 21a is formed in this 2nd furnace 21, and the siphon 201 is inserted in this feed zone 21a. This siphon 201 is arranged so that an end mouth (tip part 201b of another side of the siphon 201) may appear frequently from the oil level of the aluminum to which melting of the feed zone 21a was carried out. That is, one tip part 201a of the siphon 201 extends to near the pars basilaris ossis occipitalis of the 2nd furnace 21, and the tip part 201b of another side of the siphon 201 is drawn from the feed zone 21a outside. The siphon 201 inclines fundamentally according to the maintaining structure 202, and is held. About 10 degrees leans to the altitude and the angle of inclination agrees with the inclination of the tip part of the piping 56 in the above-mentioned container 100. It is connected to the tip part of the piping 56 in the container 100, and it becomes easy by agreeing an inclination in this way to connect the tip part 201b of this siphon 201 with the tip part 201b of the siphon 201 and the tip part of the piping 56 in the container 100.
[0066]And the piping 67 connected to the pump 313 for decompression is connected to the piping 66. Next, the pump 313 is operated and the inside of the container 100 is decompressed. Thereby, the molten aluminum currently stored in the 2nd furnace 21 is introduced in the container 100 via the siphon 201 and the piping 56.
[0067]According to this embodiment, since he is trying to introduce the molten aluminum currently especially stored in the 2nd furnace 21 in this way in the container 100 via the siphon 201 and the piping 56, molten aluminum does not contact external air. Therefore, an oxide does not arise and the molten aluminum supplied using this system becomes what has dramatically good quality. The work for removing an oxide from the inside of the container 100 becomes unnecessary, and workability's improves.
[0068]Especially according to this embodiment, since the introduction of molten aluminum and the derivation of molten aluminum from the container 100 to the container 100 can be substantially performed only using the piping 56 and 312 of two, a system configuration can be made very simple. Since the opportunity for molten aluminum to contact the open air decreases sharply, generation of an oxide can be lost mostly.

[0069]Drawing 6 shows the manufacturing flow at the time of applying the above system to an auto factory.
[0070]First, as shown in drawing 5, the molten aluminum currently stored in the 2nd furnace 21 is introduced in the container 100 via the siphon 201 and the piping 56 (Step 501). (****)
[0071]Next, as shown in drawing 1, the container 100 is conveyed from the 2nd factory 20 to the 1st factory 10 with the track 32 via the public road 30 (Step 502).
[0072]Next, at the 1st factory (point of use) 10, the container 100 is delivered even to the dies casting machine 11 for automobile engine manufacture with the delivery van 18, and molten aluminum is supplied to the holding furnace 12 from the container 100 (Step 503).
[0073]Next, in this dies casting machine 11, molding of the automobile engine using the molten aluminum stored by the holding furnace 12 is performed (Step 504).
[0074]And an assembly of a car is performed using the automobile engine and other parts which were molded in this way, and a car is completed (Step 505).
[0075]In this embodiment, since the engine of a car is a product made from aluminum which hardly contains an oxide as mentioned above, it is possible to manufacture the car which has an engine with sufficient performance and endurance.
[0076]Another embodiment of this invention is described.
[0077]Drawing 7 is a sectional view of the container concerning a 2nd embodiment of this invention. The state where it was made to incline is shown by the figure.
[0078]The container 2100 shown in the figure is provided with the following.
Package body 2110.
Piping 2130 allocated out of the package body 2110 from the position [center / 2111 / of the package body 2110] 2112 shifted.

[0079]The package body 2110 has the opening 2113 in the upper part, and it is equipped with the lid 2114 so that the opening 2113 may be plugged up.
[0080]The package body 2110 is provided with the following.
The 1st frame 2116 that constitutes the 1st space 2115, for example, consists of steel, such as SS400 (JIS).
The 2nd frame 2118 that consists of steel, such as SS400 (JIS), for example, it was allocated so that the 2nd space 117 might be constituted between the 1st frame 2116.
As for these frame materials, it is preferred to constitute from material with a small coefficient of linear expansion, and it is preferred that the difference of a coefficient of linear expansion with insulators, such as an axle-pin rake who constructs to a inner layer, adopts a small material. That the 1st frame and 2nd frame make the physical properties cooperate furthermore has chosen and adopted the material which has the same physical properties preferably here.
[0081]The locking members 2119 and 2119 of the shape of a character of one pair of mouths in which the fork of a fork lift truck is inserted are attached to the pars basilaris ossis occipitalis of the package body 2110.

[0082]The opening 2121 for [the] pouring the molten metal 2120 of metal, such as aluminum, into main slippage into the package body 2110 mostly is formed in the lid 2114, The child lid 2122 is fixed to the opening 2121 by the fastener which the child lid 2122 was pivoted by the opening 2121, and omitted the graphic display.
[0083]The feed port 2123 for introducing the gas for application of pressure into the 1st space 2115 in the package body 2110 from the booster pump which omitted the graphic display is established in the lid 2114. Oxidation of the molten metal 2120 can be prevented by using inactive gas, such as nitrogen gas, as the above-mentioned gas.
[0084]The piping 2130 allocated out of the package body 2110 from the position [center / 2111 / of the package body 2110] 2112 shifted is attached to the lid 2114. The lower end 2131 of the piping 2130 is located to near the pars basilaris ossis occipitalis in the package body 2110. The mechanism whose opening and closing of this lower end 2131 are enabled may be formed. Thereby, when a container falls, it becomes possible to prevent hot water from flowing out. The piping 2130 is provided with the following.
The inclined part 2132 which inclines 5 degrees - about 10 degrees towards the upper part out of the package body 2110.
The discharge part 2133 which is turned caudad and carries out an opening.

[0085]Here, in the case of a container [80 cm in inside diameter], the interval of the center 2111 of the package body 2110 and the above-mentioned gap position 2112 is about 30 cm, for example. Even if this displacement is larger and it is small, it can acquire the same effect.
[0086]In such a container 2100, first, according to a horizontal state, an application-of-pressure gas is introduced from the feed port 2123, and the molten metal 2120 in the package body 2110 is fed outside from the piping 2130. Then, it is made to incline in the piping 2130 side by a fork lift truck, as shown in drawing 7, and the remaining molten metals 2120 are fed outside from the piping 2130.
[0087]In the container 2100 of this embodiment constituted in this way. Since the piping 2130 has shifted from the center of the package body 2110, if it returns horizontally after the displacement to the oil level in the package body 2110 becomes large and breathes out a molten metal in this state, when it leans, space will be made between the lower end 2131 of the piping 2130, and the 2120th page of a molten metal, and pipe clogging will be prevented.
[0088]Drawing 8 is a sectional view of the container concerning a 3rd embodiment of this invention. The same numerals are given to the same component as the component already illustrated by following embodiments, and explanation is omitted.
[0089]In this container 2200, at least one passage (piping) 2210 which connects the 1st space 2115 and 2nd space 2117 is formed.
[0090]The pressurizing mechanism 2220 and the leak valve 2230 are attached to the 2nd space 2117.

[0091]In the pressurizing mechanism 2220, application-of-pressure air is introduced into the 2nd space 2117 from the air tank 2223 via 2222 in the pressurizing valve 2221 and a reducing valve. moreover -- the pressurizing mechanism 2220 -- pressure KONTORA 2224 -- attachment ******.

[0092]It is also possible to replace with the pressurizing mechanism 2220 and to connect a vacuum pump.

[0093]If the 2nd space 2117 is lengthened to the vacuum, it will be kept warm, and the fall of the insulation efficiency by aging of thermal insulation can be compensated with the container 2200 constituted in this way. For example, what is necessary is just to raise a degree of vacuum according to aging.

[0094]In the container 2200 constituted in this way, if the 1st space 2115 is pressurized from the between [the 2nd empty 2116] side via the passage 2210, after a feeding gas is preheated, it will be supplied to the inside of a container (the 1st space 2115). Therefore, the temperature fall of a molten metal can be suppressed small. In particular, in a feeding culmination, it is easy to generate the intermittent regurgitation of a molten metal and a gas, the temperature of a molten metal is taken by the feeding gas in that case, and viscosity becomes large. Therefore, by preheating a feeding gas, the temperature fall of a molten metal can be controlled and pipe clogging can be prevented effectively. In addition, safe stopping hot water supply can also be performed and time which stopping hot water supply takes can be shortened.

[0095]In the container 2200 constituted in this way, by it being made to perform leak of the 1st space 2115 by the leak valve 2230 from the 2nd space 2117 side via the passage 2210, after cooling high temperature gas to some extent, it is leaking from the leak valve 2230. Therefore, the thermal load concerning the leak valve 2230 can be reduced, and improvement in reliability of a device and reinforcement can be attained.

[0096]Drawing 9 is a sectional view of the container concerning a 4th embodiment of this invention.

[0097]In the container 2300 shown in the figure, the pressurizing mechanism 2220 is connected to the 1st space 2115, and the reduced pressure control 2310 is connected to the 2nd space 2117. In the reduced pressure control 2310, the vacuum pump 2312 is connected to the 2nd space 2117, for example via the vacuum valve 2311, and the vacuum meter 2313 and the leak valve 2314 are inserted among them.

[0098]The leak valve 2320 as the 2nd valve is inserted in the passage 2210 which connects the 1st space 2115 and 2nd space 2117, and also the leak valve 2321 as the 1st valve is connected into the package body.

[0099]In the container 2300 of such composition, improvement in the reliability of the time reduction which stopping-hot-water-supply operation takes, or stop operation can be aimed at. That is, the 2nd space 2117 is decompressed, at the time of stopping hot water supply, opens wide the leak valve 2320 as the 2nd valve of the occasion that opens the leak valve 2321 as the 1st valve wide first, and carries out ** pressure of the inside of the 1st space

2115, and makes the 1st space 2115 negative pressure. Thereby, pull back by the side of perfect stopping hot water supply and also the container of the molten metal in piping can be performed.

[0100]Drawing 10 is a sectional view of the container concerning a 5th embodiment of this invention.

[0101]In the container 2400 shown in the figure, the piping 2420 which has an inclination which goes up is connected near the package body 2410 pars basilaris ossis occipitalis. The other end of the piping 2420 is prolonged to the position higher than the container 2400 at least.

[0102]Drawing 11 is a sectional view of the container concerning a 6th embodiment of this invention.

[0103]In the container 2500 shown in the figure, the septum 2520 carried out for 2 minutes opening the inside of the package body 2510 for free passage near the lower part and the gutter 2540 which while was divided and was connected to the space 2530 side by the septum 2520 are provided. The pressurizing mechanism 2220 is connected to the space 2531 of another side. The lid 2541 is formed in the upper part of the bucket part 2540.

[0104]In the container 2500 of this embodiment, if the inside of a container is pressurized according to the pressurizing mechanism 2220, the hot water in a container will be breathed out outside via the gutter 2540.

[0105]namely, the time of ** maintenance with which ** maintenance will be ** got blocked very much easily if piping is in the inside of a main part -- with a piping crack -- it is said that it is cheap -- it is problematic.

[0106]On the other hand, in the container 2500 of this embodiment, use the space 2530 instead of piping, for example, it is made to overflow from the opening 2532, and while it dissociated by the septum 2520 carries out hot water supply by the gutter 2540. Even if a maintenance becomes very easy by this, it is moreover hard to get it blocked and it gets it blocked further, it can be made to usually recover by maintenance.

[0107]Drawing 12 is a sectional view of the container concerning a 7th embodiment of this invention.

[0108]The container 2600 shown in the figure removes the lid 2541 arranged in the upper part of the bucket part 2540 in the container shown in drawing 11.

[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1]It is a schematic diagram showing the composition of the metal distribution system concerning one embodiment of this invention.
[Drawing 2]It is a figure showing the relation of the container and holding furnace concerning one embodiment of this invention.
[Drawing 3]It is a sectional view of the container concerning one embodiment of this invention.
[Drawing 4]It is a top view of drawing 3.
[Drawing 5]It is a figure showing the composition of the distribution system from the 2nd furnace in the 2nd factory concerning one embodiment of this invention to a container.
[Drawing 6]It is a flow chart showing the manufacturing method of the car using the system of this invention.
[Drawing 7]It is a sectional view of the container concerning a 2nd embodiment.
[Drawing 8]It is a sectional view of the container concerning a 3rd embodiment.
[Drawing 9]It is a sectional view of the container concerning a 4th embodiment.
[Drawing 10]It is a sectional view of the container concerning a 5th embodiment.
[Drawing 11]It is a sectional view of the container concerning a 6th embodiment.
[Drawing 12]It is a sectional view of the container concerning a 7th embodiment.
[Description of Notations]
50 Package body
51 and 60 Opening
57 Channel
62 Hatch
65 The breakthrough for internal pressure adjustment
66 Piping for internal pressure adjustment
60 Opening
100 The container for molten-metal supply

[Translation done.]

* NOTICES *

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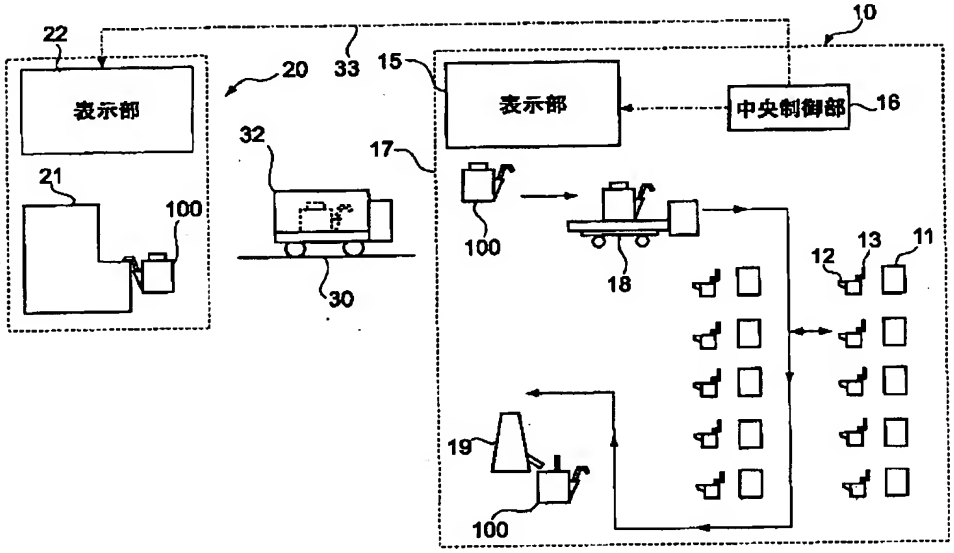
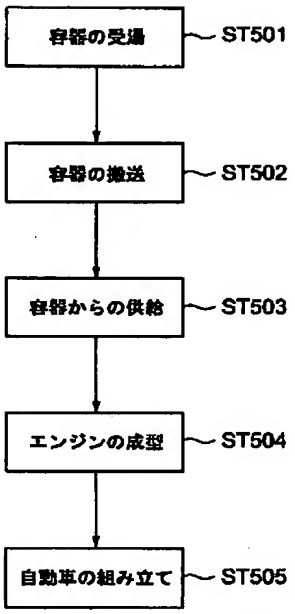
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DRAWINGS

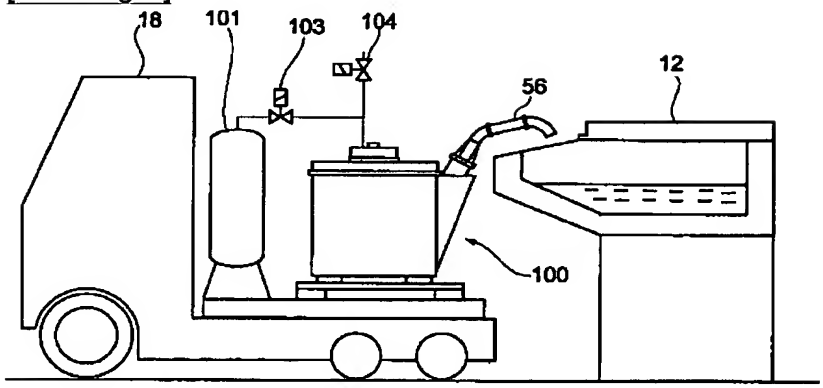
[Drawing 1]



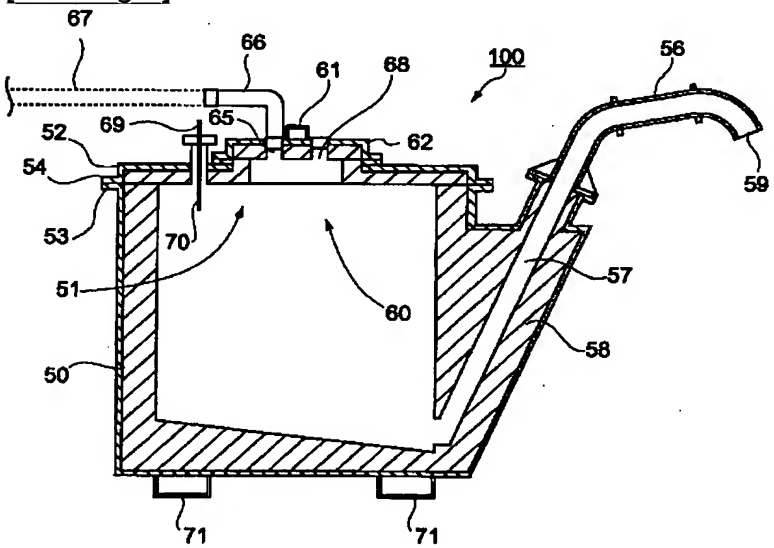
[Drawing 6]



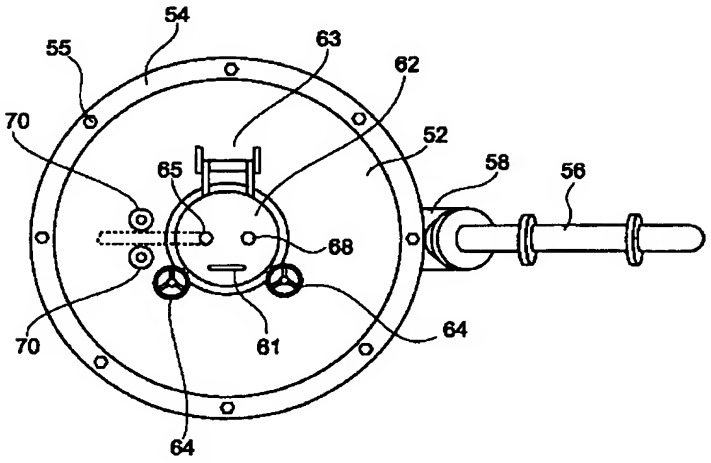
[Drawing 2]



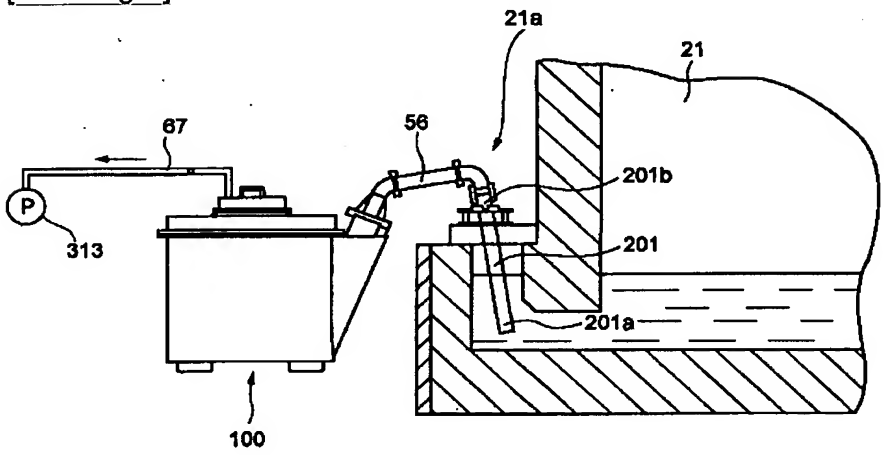
[Drawing 3]



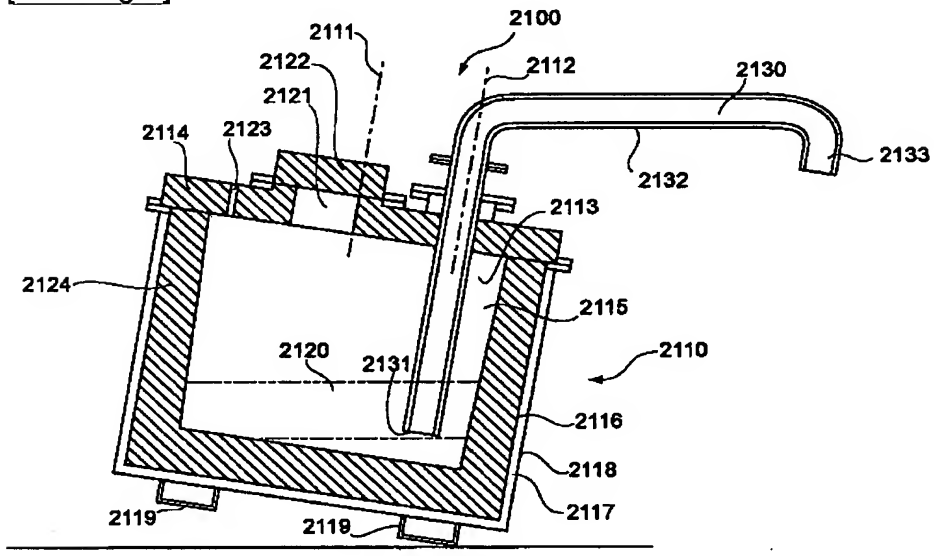
[Drawing 4]



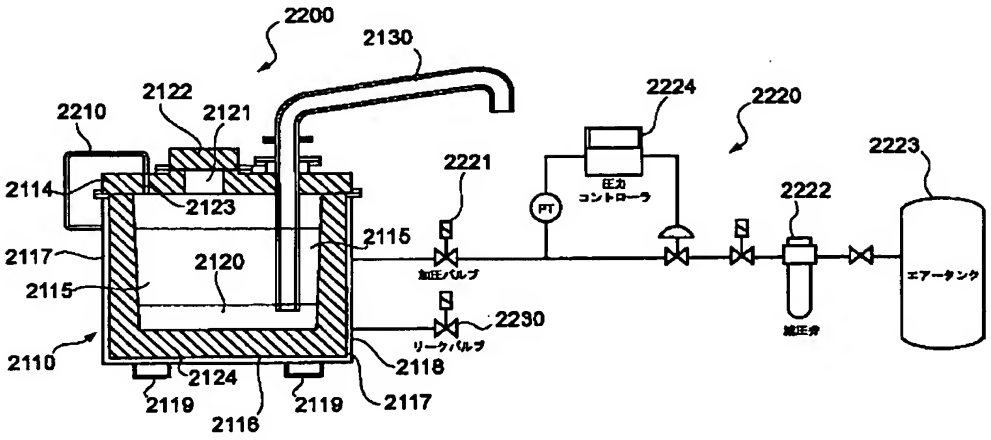
[Drawing 5]



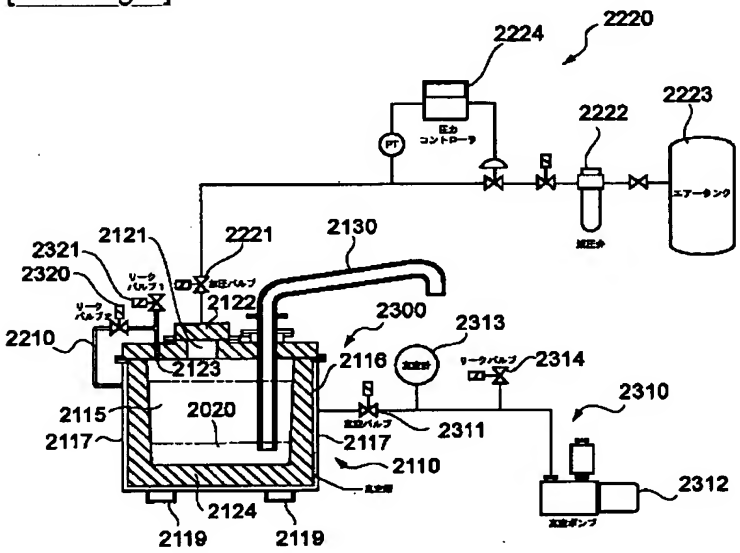
[Drawing 7]



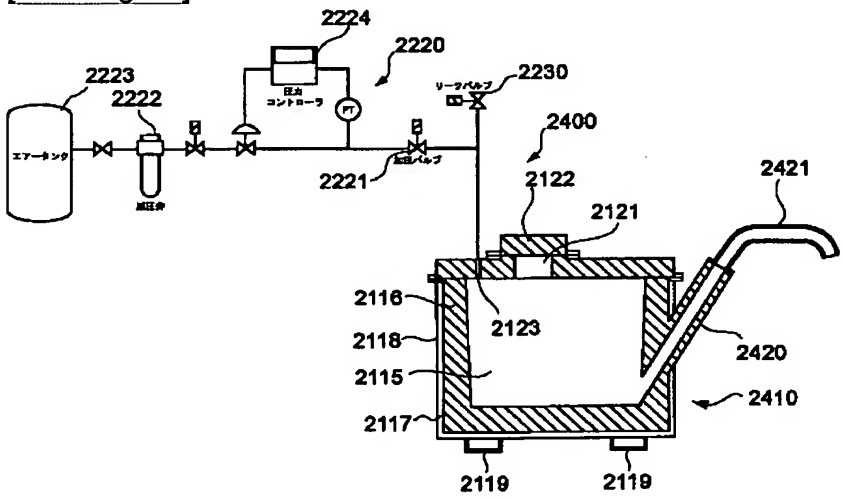
[Drawing 8]



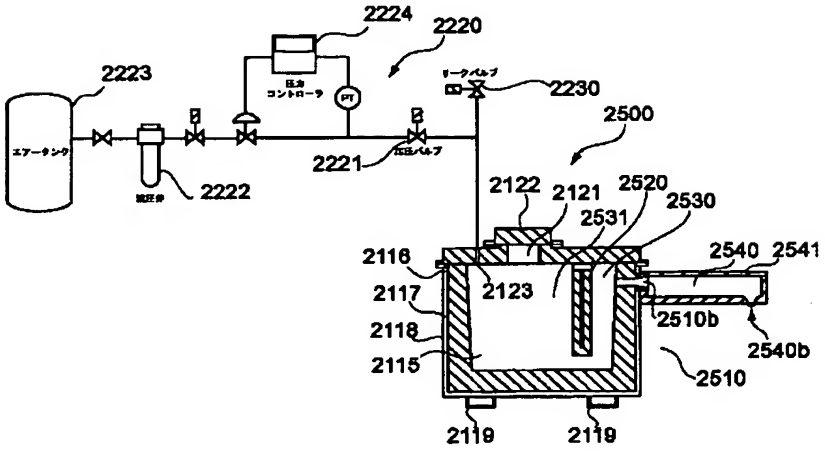
[Drawing 9]



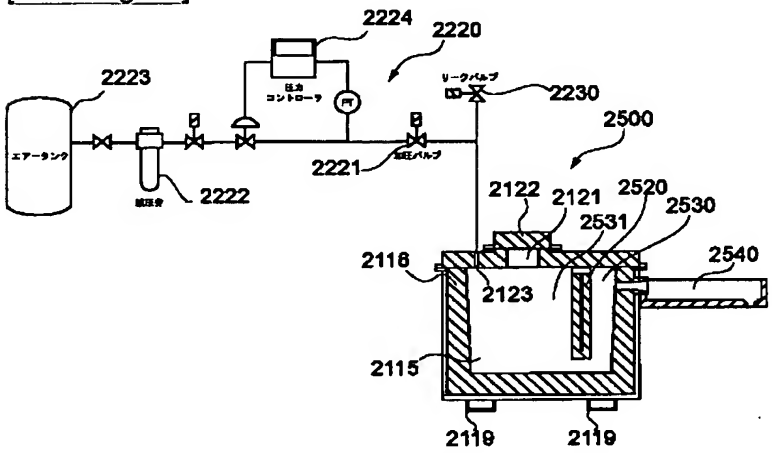
[Drawing 10]



[Drawing 11]



[Drawing 12]



[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

WRITTEN AMENDMENT

---------- [Written amendment]
[Filing date]December 5, Heisei 13 (2001.12.5)
[Amendment 1]
[Document to be Amended]Specification
[Item(s) to be Amended]Claim
[Method of Amendment]Change
[Proposed Amendment]
[Claim(s)]
[Claim 1]A container which can accommodate molten metal,
A hatch in which it was provided in an upper face part of said container so that opening and closing were possible, and a breakthrough for internal pressure adjustment which opens inside and outside of said container for free passage was provided,
A container for molten-metal supply possessing a channel which it is provided in a position which is an upper face part of said container, and is separated from the center of this upper face part rather than distance to said breakthrough, and inside and outside of said container are opened for free passage, and can be circulated in said molten metal.
[Claim 2]A container which can accommodate molten metal,
A hatch in which it was provided in an upper face part of said container so that opening and closing were possible, and a breakthrough for internal pressure adjustment which opens inside and outside of said container for free passage was provided,
A container for molten-metal supply possessing a channel which it is provided in the side of said container, and inside and outside of said container are opened for free passage, and can be circulated in said molten metal.
[Claim 3]In the container for molten-metal supply according to claim 1 or 2,
A container for molten-metal supply with which said hatch is characterized by a thing of an upper face part of said container mostly established in the center.
[Claim 4]In a container for molten-metal supply given in any 1 paragraph among claim 1 to

claims 3,
A container for molten-metal supply, wherein it is attached to said breakthrough, and it projects towards the upper part from an upper face part of said container, and is horizontally bent in a position of predetermined height and a terminal area possesses further piping drawn horizontally.
[Claim 5]In the container for molten-metal supply according to claim 4,
A container for molten-metal supply, wherein said piping is screwed on said breakthrough removable.
[Claim 6]A container which can accommodate molten metal, opens inside and outside for free passage, and has a breakthrough for internal pressure adjustment of an upper face part mostly provided in a main position,
A container for molten-metal supply possessing a channel which it is provided in a position which is an upper face part of said container, and is separated from the center of this upper face part rather than distance to said breakthrough, and inside and outside of said container are opened for free passage, and can be circulated in said molten metal.
[Claim 7]A container which can accommodate molten metal, opens inside and outside for free passage, and has a breakthrough for internal pressure adjustment of an upper face part mostly provided in a main position,
A container for molten-metal supply possessing a channel which it is provided in the side of said container, and inside and outside of said container are opened for free passage, and can be circulated in said molten metal.
[Claim 8]In the container for molten-metal supply according to claim 6 or 7,
Said container possesses further a hatch of an upper face part of the container concerned mostly provided in the central part,
A container for molten-metal supply, wherein said breakthrough is provided in said hatch.
[Claim 9]In a container for molten-metal supply given in any 1 paragraph among claim 6 to claims 8,
A container for molten-metal supply, wherein can attach to said breakthrough, and it projects towards the upper part from an upper face part of said container, and is horizontally bent in a position of predetermined height and a terminal area possesses further piping drawn horizontally.
[Claim 10]In the container for molten-metal supply according to claim 9,
A container for molten-metal supply, wherein said piping is screwed on said container removable.
[Claim 11]A container which can accommodate molten metal and has the 1st opening in the upper part,
A channel which inside and outside of said container are opened for free passage and can be circulated in said molten metal,
A lid which is arranged so that the 1st opening of said container may be covered, and has the 2nd opening of a byway rather than said 1st opening in the center mostly,

A container for molten-metal supply possessing a hatch in which it was provided in an upper face part of said lid so that opening and closing were possible, and a breakthrough for internal pressure adjustment which opens inside and outside of said container for free passage was provided.

[Claim 12]In the container for molten-metal supply according to claim 11,

A container for molten-metal supply, wherein it is attached to said breakthrough, and it projects towards the upper part from an upper face part of said container, and is horizontally bent in a position of predetermined height and a terminal area possesses further piping drawn horizontally.

[Claim 13]In the container for molten-metal supply according to claim 12,

A container for molten-metal supply, wherein said piping is screwed on said breakthrough removable.

---------- [A written amendment]

[Filing date]March 4, Heisei 14 (2002.3.4)

[The amendment 1]

[Document to be Amended]Specification

[Item(s) to be Amended]Claim

[Method of Amendment]Change

[Proposed Amendment]

[Claim(s)]

[Claim 1]A container which can accommodate molten metal and has the 1st opening in the upper part,

A channel which inside and outside of said container are opened for free passage and can be circulated in said molten metal,

A lid which is arranged so that the 1st opening of said container may be covered, and has the 2nd opening of a byway rather than said 1st opening in the center mostly,

A container for molten-metal supply possessing a hatch in which it was provided in an upper face part of said lid so that opening and closing were possible, and a breakthrough for internal pressure adjustment which opens inside and outside of said container for free passage was provided.

[Claim 2]In the container for molten-metal supply according to claim 1,

A container for molten-metal supply, wherein it is attached to said breakthrough, and it projects towards the upper part from an upper face part of said container, and is horizontally bent in a position of predetermined height and a terminal area possesses further piping drawn horizontally.

[Claim 3]In the container for molten-metal supply according to claim 2,

A container for molten-metal supply, wherein said piping is screwed on said breakthrough removable.

[Translation done.]

P06D5001 KR
Action 회신일 1/1

(19)日本国特許庁（ＪＰ）　(12)公開特許公報（A）　(11)特許出願公開番号
特開2002－254158
（P2002－254158A）
(43)公開日　平成14年９月10日（2002.9.10）

(51)Int.Cl.'	識別記号	ＦＩ		テーマコード（参考）
Ｂ２２Ｄ 39/06		Ｂ２２Ｄ 39/06		４Ｅ０１４
17/30		17/30	Ｚ	
41/00		41/00	Ｃ	
41/12		41/12	Ｚ	

審査請求　有　請求項の数３　ＯＬ　（全 15 頁）

(21)出願番号　特願2001－189650(P2001－189650)
(22)出願日　平成13年６月22日(2001.6.22)
(31)優先権主張番号　特願2000－399465(P2000－399465)
(32)優先日　平成12年12月27日(2000.12.27)
(33)優先権主張国　日本（ＪＰ）

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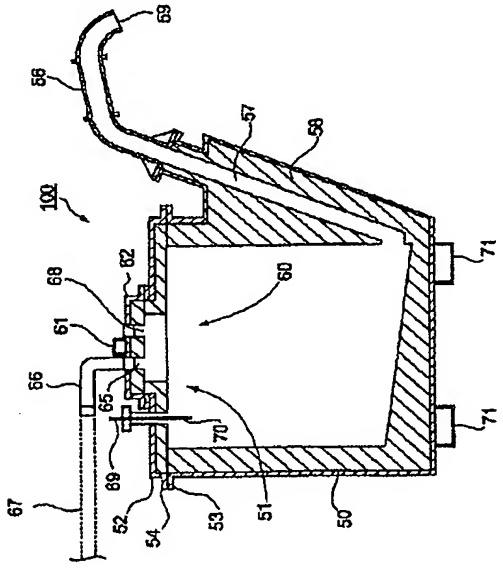
Ｆターム(参考)　4E014 AB02 HA00 HA01 LA04 LA09 LA10

(54)【発明の名称】　溶融金属供給用容器

(57)【要約】
【課題】　内圧調整に用いるための配管や孔の詰りを防止すること．
【解決手段】　溶融したアルミニウム等の溶融金属を供給するために用いる容器であって、ハッチ６２に内圧調整用の貫通孔６５を設け、その貫通孔６５に内圧調整用の配管６６を接続しているので、容器１００内に溶融金属を供給する度に内圧調整用の貫通孔６５に対する金属の付着を確認することができる．従って、内圧調整に用いるための配管６６や貫通孔６５の詰りを未然に防止することができる．



【特許請求の範囲】
【請求項１】　溶融金属を収容することができる容器と、
前記容器の内外を連通し、前記溶融金属を流通することが可能な流路と、
前記容器の上面部に開閉可能に設けられ、前記容器の内外を連通する内圧調整用の貫通孔が設けられたハッチとを具備することを特徴とする溶融金属供給用容器。
【請求項２】　請求項１に記載の溶融金属供給用容器において、
前記ハッチは、前記容器の上面部のほぼ中央に設けられていることを特徴とする溶融金属供給用容器。
【請求項３】　請求項１又は請求項２に記載の溶融金属供給用容器において、
前記貫通孔に取り付けられ、前記容器の上面部から上方に向けて突出し、所定の高さの位置で水平方向に折り曲げられ、水平方向に導出された配管を更に具備することを特徴とする溶融金属供給用容器。
【請求項４】　請求項３に記載の溶融金属供給用容器において、
前記配管は、前記貫通孔に着脱可能に螺着されていることを特徴とする溶融金属供給用容器。
【請求項５】　溶融金属を収容することができ、内外を連通し、上面部のほぼ中心の位置に設けられた内圧調整用の貫通孔を有する容器と、
前記容器の内外を連通し、前記溶融金属を流通することが可能な流路とを具備したことを特徴とする溶融金属供給用容器。
【請求項６】　請求項５に記載の溶融金属供給用容器において、
前記容器は、当該容器の上面部のほぼ中心部に設けられたハッチを更に具備し、
前記貫通孔は、前記ハッチに設けられていることを特徴とする溶融金属供給用容器。
【請求項７】　請求項５又は請求項６に記載の溶融金属供給用容器において、
前記貫通孔に取り付けれ、前記容器の上面部から上方に向けて突出し、所定の高さの位置で水平方向に折り曲げられ、水平方向に導出された配管を更に具備することを特徴とする溶融金属供給用容器。
【請求項８】　請求項７に記載の溶融金属供給用容器において、
前記配管は、前記容器に着脱可能に螺着されていることを特徴とする溶融金属供給用容器。
【請求項９】　溶融金属を収容することができ、上部に第１の開口部を有する容器と、
前記容器の内外を連通し、前記溶融金属を流通することが可能な流路と、
前記容器の第１の開口部を覆うように固定的に配置され、ほぼ中央に前記第１の開口部よりも小径の第２の開口部を有する蓋と、
前記蓋の上面部に開閉可能に設けられ、前記容器の内外を連通する内圧調整用の貫通孔が設けられたハッチとを具備することを特徴とする溶融金属供給用容器。
【発明の詳細な説明】
【０００１】
【発明の属する技術分野】本発明は、例えば溶融したアルミニウムの運搬に用いられる溶融金属供給用容器に関する。
【０００２】
【従来の技術】多数のダイキャストマシーンを使ってアルミニウムの成型が行われる工場では、工場内ばかりでなく、工場外からアルミニウム材料の供給を受けることが多い。この場合、溶融した状態のアルミニウムを収容した取鍋を材料供給側の工場から成型側の工場へと搬送し、溶融した状態のままの材料を各ダイキャストマシーンへ供給することが行われている。
【０００３】従来から用いられている取鍋は、溶融金属が貯留される容器本体の側壁に供給用の配管を取り付けたいわば急須のような構造で、かかる取鍋を傾けることにより配管から成型側の保持炉に溶融金属を供給することが行われている。
【０００４】
【発明が解決しようとする課題】しかしながら、このような取鍋では、例えば取鍋の傾斜をフォークリフトを用いて行っており、そのような作業は必ずしも安全なものとはいえなかった。また、取鍋を傾斜させるためにフォークリフトに回動機構を設ける必要があるため、構成が特殊となり、更にそのような操作のためにフォークリフトの操作に熟練した作業者が必要とされる、という課題があった。
【０００５】そのため、本発明者等は、圧力差を利用した溶融金属の供給システムを提唱している。このシステムは、密閉された容器に外部に溶融金属を導出するための配管を設け、さらにこの容器に加圧気体を供給するための配管を接続し、容器内を加圧することで金属導出用の配管から外部の例えば成型側の保持炉に溶融金属を導出している。
【０００６】しかしながら、上記構成の容器では、加圧気体供給用の配管が詰り易い、という問題がある。特に、上記のシステムでは、例えば容器はトラックに搭載され公道を介して工場から他の工場に運搬されるために揺れることが多く、このため容器内の溶融金属の液面が傾いたり、液滴が容器内で飛び散り、これらが加圧気体供給用の配管に付着する。そして、例えばこのような付着が度重なることで配管詰りが発生している。
【０００７】以上の事情に鑑み、本発明の主たる目的は、内圧調整に用いるための配管や孔の詰りを防止することができる溶融金属供給用容器を提供することにある。

【０００８】
【課題を解決するための手段】かかる課題を解決するため、本発明の主たる観点に係る溶融金属供給システムは、溶融金属を収容することができる容器と、前記容器の内外を連通し、前記溶融金属を流通することが可能な流路と、前記容器の上面部に開閉可能に設けられ、前記容器の内外を連通する内圧調整用の貫通孔が設けられたハッチとを具備するものである。
【０００９】通常、かかる容器内に溶融金属を供給するに先立ちガスバーナ等の加熱器により容器を予熱している。この予熱は、ハッチを開けて加熱器の一部を容器内に挿入することで行われる。従って、ハッチは容器内に溶融金属を供給する度に開けられるものである。本発明では、このようなハッチに内圧調整用の貫通孔を設けているので、容器内に溶融金属を供給する度に内圧調整用の貫通孔に対する金属の付着を確認することができる。そして、例えば貫通孔に金属が付着しているときにはその都度それを剥がせばよい。従って、本発明では、内圧調整に用いるための配管や孔の詰りを未然に防止することができる。また本発明においては、このハッチは容器内部を気密を確保するためのパッキン等の封止部材を備えている。パッキンは例えばシリコン製のものなど耐熱性を有するものが好ましい。
【００１０】本発明の溶融金属供給用容器は、前記ハッチが、前記容器の上面部のほぼ中央に設けられていることを特徴とするものである。
【００１１】容器が揺れて液面が傾いたり、液滴が飛び散る場合、容器内の外周付近よりも中央部に近い方がより液面の変化や液滴が飛び散る度合いが小さい。本発明では、ハッチに内圧調整用の貫通孔が設けられ、しかもそのハッチが上記のように液面の変化や液滴が飛び散る度合いが小さい位置に対応する容器の上面部のほぼ中央に設けられているので、金属が内圧調整に用いるための配管や孔に付着することが少なくなる。従って、本発明では、内圧調整に用いるための配管や孔の詰りを防止することができる。
【００１２】本発明の溶融金属供給用容器は、前記貫通孔に取り付けられ、前記容器の上面部から上方に向けて突出し、所定の高さの位置で水平方向に折り曲げられ、水平方向に導出された配管を更に具備するものである。
【００１３】本発明に係る容器が使われるシステムでは、例えば貫通孔に取り付けられた配管に加圧気体供給用のタンクや減圧用のポンプからの配管が接続される。そのような接続は、容器内に溶融金属を導入する度、或いは容器内から溶融金属を導出する度に行われる。一方、溶融金属が貯留される容器は非常に高温であり、作業性が悪い状態にある。本発明に係る容器では、内圧調整用の貫通孔が容器上面のほぼ中央にある構成であり、そのまま上方に伸びる配管を取り付けたのでは上記のような配管間の接続の作業性が非常に悪い。これに対して、上記のように配管が水平方向に導出するような構成とすることで、例えば作業者が配管間の接続ポイントに手を伸ばして作業を安全にかつ簡単に行うことができる。
【００１４】本発明の溶融金属供給用容器は、前記配管が前記貫通孔に着脱可能に螺着されていることを特徴とするものである。
【００１５】本発明では、配管を貫通孔に対して着脱可能に螺着するように構成することで、水平方向に導出されている配管自体をいわばスパナのようにな用い方で配管を貫通孔から着脱すること可能となる。従って、配管の着脱を特別な工具等を用いることなく簡単に行うことができる。これにより、例えば配管の詰まり具合をしばしば確認することが可能となり、内圧調整に用いるための配管の詰りを未然に防止することができる。
【００１６】本発明の別の観点に係る溶融金属供給用容器は、溶融金属を収容することができ、内外を連通し、上面部のほぼ中心の位置に設けられた内圧調整用の貫通孔を有する容器と、前記容器の内外を連通し、前記溶融金属を流通することが可能な流路とを具備したことを特徴とするものである。
【００１７】上述したように容器が揺れて液面が傾いたり、液滴が飛び散る場合、容器内の外周付近よりも中央部に近い方がより液面の変化や液滴が飛び散る度合いが小さい。本発明では、内圧調整用の貫通孔がこのように液面の変化や液滴が飛び散る度合いが小さい位置に対応する容器の上面部のほぼ中央に設けられているので、金属が内圧調整に用いるための配管や孔に付着することが少なくなる。従って、本発明では、内圧調整に用いるための配管や孔の詰りを防止することができる。
【００１８】本発明の溶融金属供給用容器は、前記容器は、当該容器の上面部のほぼ中心部に設けられたハッチを更に具備し、前記貫通孔は、前記ハッチに設けられていることを特徴とするものである。
【００１９】上述したように、通常、容器内に溶融金属を供給するに先立ちガスバーナにより容器を予熱している。この予熱は、ハッチを開けてガスバーナを容器内に挿入することで行われる。従って、ハッチは容器内に溶融金属を供給する度に開けられるものである。本発明では、このようなハッチに内圧調整用の貫通孔を設けているので、容器内に溶融金属を供給する度に内圧調整用の貫通孔に対する金属の付着を確認することができる。そして、例えば貫通孔に金属が付着しているときにはその都度それを剥がせばよい。従って、本発明では、内圧調整に用いるための配管や孔の詰りを未然に防止することができる。
【００２０】本発明の溶融金属供給用容器は、前記貫通孔に取り付けれ、前記容器の上面部から上方に向けて突出し、所定の高さの位置で水平方向に折り曲げられ、水平方向に導出された配管を更に具備するものである。

【００２１】本発明の更に別の観点に係る溶融金属供給用容器は、溶融金属を収容することができ、上部に第１の開口部を有する容器と、前記容器の内外を連通し、前記溶融金属を流通することが可能な流路と、前記容器の第１の開口部を覆うように固定的に配置され、ほぼ中央に前記第１の開口部よりも小径の第２の開口部を有する蓋と、前記蓋の上面部に開閉可能に設けられ、前記容器の内外を連通する内圧調整用の貫通孔が設けられたハッチとを具備するものである。

【００２２】本発明では、このようなハッチに内圧調整用の貫通孔を設けているので、容器内に溶融金属を供給する度に内圧調整用の貫通孔に対する金属の付着を確認することができる。従って、本発明では、内圧調整に用いるための配管や孔の詰りを未然に防止することができる。本発明では、ハッチに内圧調整用の貫通孔が設けられ、しかもそのハッチが上記のように液面の変化や液滴が飛び散る度合いが小さい位置に対応する容器の上面部のほぼ中央に設けられているので、金属が内圧調整に用いるための配管や孔に付着することが少なくなる。従って、本発明では、内圧調整に用いるための配管や孔の詰りを防止することができる。更に、本発明では、ハッチが蓋の上面部に設けられているので、ハッチの裏面と液面との距離が蓋の裏面と液面との距離に比べて蓋の厚み分だけ長くなる。従って、貫通孔が設けられたハッチの裏面に金属が付着する可能性が低くなる。よって、本発明では、内圧調整に用いるための配管や孔の詰りを防止することができる。

【００２３】上記容器としては、容器本体と、前記容器本体の中心からずれた位置から容器本体外に配設された配管とを具備するようにしても構わない。

【００２４】配管が容器内で溶湯に浸かったままだとすぐに詰まってしまうのに対して、本発明では、配管が容器本体の中心からずれているので、傾けたときに容器内の液面に対する変位が大きくなり、この状態で溶湯を吐き出した後水平に戻すと配管下端と溶湯面との間に空間ができ、配管詰まりが防止される。

【００２５】本発明の容器は、第１の空間を構成する第１のフレームと、前記第１のフレームとの間に第２の空間を構成するように配設された第２のフレームと、前記第１の空間と前記第２の空間とを接続する少なくとも１つの通路とを具備する。

【００２６】本発明では、第２の空間を真空に引いておけば保温になり、断熱材の経時変化による断熱性能の低下を補償することができる。また、通路を介して第２の空間側から第１の空間を加圧すると、圧送気体は予熱されてから容器内部に供給される。従って、溶湯の温度低下を小さく抑えることができる。特に、圧送最終段階においては溶湯と気体の間欠吐出が発生しやすく、その場合に溶湯の温度が圧送気体に奪われて粘性が大きくなる。従って、圧送気体を予熱することで、溶湯の温度低下を抑制し、配管詰まりを効果的に防止することができる。加えて、安全な給湯停止もでき、給湯停止に要する時間を短くすることができる。

【００２７】また、本発明では、第１の空間のリークを通路を介して第２の空間側から行うようにすることができる。圧送停止時には加圧された第１の空間の気体をリークして常圧に復圧するが、そのとき第１の空間の気体は溶湯と共存しているから非常に高温であり、この高温気体を直接的にリークしたのではリークバルブを痛めることになる。これに対して、第１の空間のリークを通路を介して第２の空間側から行うことで、リークバルブにかかる熱的負荷を軽減し、装置の信頼性向上、長寿命化を図ることができる。

【００２８】本発明の容器は、第１の空間を構成する第１のフレームと、前記第１のフレームとの間に第２の空間を構成するように配設された第２のフレームと、前記第１の空間と前記第２の空間とを接続する少なくとも１つの通路と、前記容器本体内と接続された第１のバルブと、前記通路上に介挿されたた第２のバルブとを具備する。

【００２９】本発明では、給湯停止動作に要する時間短縮、もしくは停止動作の信頼性の向上を図ることができる。すなわち、第２の空間は減圧しておき、給湯停止時には、まず第１のバルブを開放して第１の空間内を復圧する。ついで第２のバルブを開放し第１の空間を負圧にする。これにより完全な給湯停止、更には配管内の溶湯の容器側への引き戻しができる。

【００３０】本発明の容器は、容器本体と、容器本体底部付近に接続され、少なくとも上方に向かう傾斜を有する配管とを具備する。

【００３１】本発明の容器は、容器本体と、容器本体内を下部付近で連通しつつ２分する隔壁と、前記隔壁の区切られた一方の空間側に接続された樋部とを具備する。

【００３２】本発明の容器は、容器本体と、容器本体内を下部付近で連通しつつ２分する隔壁と、前記隔壁の分離された一方の空間側に接続された樋部と、前記樋部上に設けられた蓋とを具備する。

【００３３】すなわち、配管が本体内部にあると、
メンテナンスが大変
詰まりやすい
メンテナンス時に配管傷つきやすい
という問題ある。

【００３４】本発明では、隔壁で分離された一方の空間を配管の代わりに使用し、例えば開口部からオーバーフローさせて樋部で給湯するものである。これによりメンテナンスが非常に簡単になり、しかも詰まりにくく、更には詰まっても通常メンテナンスで回復させることができる。

【００３５】

【発明の実施の形態】以下、本発明の実施の形態を図面

に基づき説明する．

【００３６】図１は本発明の一実施形態に係る金属供給システムの全体構成を示す図である．

【００３７】同図に示すように，第１の工場１０と第２の工場２０とは例えば公道３０を介して離れた所に設けられている．

【００３８】第１の工場１０には，ユースポイントとしてのダイキャストマシーン１１が複数配置されている．各ダイキャストマシーン１１は，溶融したアルミニウムを原材料として用い，射出成型により所望の形状の製品を成型するものである．その製品としては例えば自動車のエンジンに関連する部品等を挙げることができる．また，溶融した金属としてはアルミニウム合金ばかりでなくマグネシウム，チタン等の他の金属を主体とした合金であっても勿論構わない．各ダイキャストマシーン１１の近くには，ショット前の溶融したアルミニウムを一旦貯留する保持炉（手元保持炉）１２が配置されている．この保持炉１２には，複数ショット分の溶融アルミニウムが貯留されるようになっており，ワンショット毎にラドル１３或いは配管を介して保持炉１２からダイキャストマシーン１１に溶融アルミニウムが注入されるようになっている．また，各保持炉１２には，容器内に貯留された溶融アルミニウムの液面を検出する液面検出センサ（図示せず）や溶融アルミニウムの温度を検出するための温度センサ（図示せず）が配置されている．これらのセンサによる検出結果は各ダイキャストマシーン１１の制御盤もしくは第１の工場１０の中央制御部１６に伝達されるようになっている．

【００３９】第１の工場１０の受け入れ部には，後述する容器１００を受け入れるための受け入れ台１７が配置されている．受け入れ部の受け入れ台１７で受け入れられた容器１００は，配送車１８により所定のダイキャストマシーン１１まで配送され，容器１００から保持炉１２に溶融アルミニウムが供給されるようになっている．供給の終了した容器１００は配送車１８により再び受け入れ部の受け入れ台１７に戻されるようになっている．

【００４０】第１の工場１０には，アルミニウムを溶融して容器１００に供給するための第１の炉１９が設けられており，この第１の炉１９により溶融アルミニウムが供給された容器１００も配送車１８により所定のダイキャストマシーン１１まで配送されるようになっている．

【００４１】第１の工場１０には，各ダイキャストマシーン１１において溶融アルミニウムの追加が必要になった場合にそれを表示する表示部１５が配置されている．より具体的には，例えばダイキャストマシーン１１毎に固有の番号が振られ，表示部１５にはその番号が表示されており，溶融アルミニウムの追加が必要になったダイキャストマシーン１１の番号に対応する表示部１５における番号が点灯するようになっている．作業者はこの表示部１５の表示に基づき配送車１８を使って容器１００をその番号に対応するダイキャストマシーン１１まで運び溶融アルミニウムを供給する．表示部１５における表示は，液面検出センサによる検出結果に基づき，中央制御部１６が制御することによって行われる．

【００４２】第２の工場２０には，アルミニウムを溶融して容器１００に供給するための第２の炉２１が設けられている．容器１００は例えば容量，配管長，高さ，幅等の異なる複数種が用意されている．例えば第1の工場１０内のダイキャストマシーン１１における保持炉１２の容量等に応じて，容量の異なる複数種がある．しかしながら，容器１００を１種類に統一して規格化しても勿論構わない．

【００４３】この第２の炉２１により溶融アルミニウムが供給された容器１００は，フォークリフト（図示せず）により搬送用のトラック３２に載せられる．トラック３２は公道３０を通り第１の工場１０における受け入れ部の受け入れ台１７の近くまで容器１００を運び，これらの容器１００はフォークリフト（図示せず）により受け入れ台１７に受け入れられるようになっている．また，受け入れ部にある空の容器１００はトラック３２により第２の工場２０へ返送されるようになっている．

【００４４】第２の工場２０には，第１の工場１０における各ダイキャストマシーン１１において溶融アルミニウムの追加が必要になった場合にそれを表示する表示部２２が配置されている．表示部２２の構成は第１の工場１０内に配置された表示部１５とほぼ同様である．表示部２２における表示は，例えば通信回線３３を介して第１の工場１０における中央制御部１６が制御することによって行われる．なお，第２の工場２０における表示部２２においては，溶融アルミニウムの供給を必要とするダイキャストマシーン１１のうち第１の工場１０における第１の炉１９から溶融アルミニウムが供給されると決定されたダイキャストマシーン１１はそれ以外のダイキャストマシーン１１とは区別して表示されるようになっている．例えば，そのように決定されたダイキャストマシーン１１に対応する番号は点滅するようになっている．これにより，第１の炉１９から溶融アルミニウムが供給されると決定されたダイキャストマシーン１１に対して第２の工場２０側から誤って溶融アルミニウムを供給するようなことをなくすことができる．また，この表示部２２には，上記の他に中央制御部１６から送信されたデータも表示されるようになっている．

【００４５】次に，このように構成された金属供給システムの動作を説明する．

【００４６】中央制御部１６では，各保持炉１２に設けられた液面検出センサを介して各保持炉１２における溶融アルミニウムの量を監視している．ここで，ある保持炉１２で溶融アルミニウムの供給の必要性が生じた場合に，中央制御部１６は，その保持炉１２の「固有の番号」，その保持炉１２に設けられた温度センサにより検

出された保持炉１２の「温度データ」、その保持炉１２の形態（後述する。）に関する「形態データ」、その保持炉１２から溶融アルミニウムがなくなる最終的な「時刻データ」、公道３０の「トラフィックデータ」、その保持炉１２で要求される溶融アルミニウムの「量データ」及び「気温データ」等を、通信回線３３を介して第２の工場２０側に送信する。第２の工場２０では、これらのデータを表示部２２に表示する。これらの表示されたデータに基づき作業者が経験的に上記保持炉１２から溶融アルミニウムがなくなる直前に保持炉１２に容器１００が届き、且つその時の溶融アルミニウムが所望の温度となるように該第２の工場２０からの容器１００の発送時刻及び溶融アルミニウムの発送時の温度を決定する。或いはこれらのデータを例えばパソコン（図示せず）に取り込んで所定のソフトウェアを用いて上記保持炉１２から溶融アルミニウムがなくなる直前に保持炉１２に容器１００が届き、且つその時の溶融アルミニウムが所望の温度となるように該第２の工場２０からの容器１００の発送時刻及び溶融アルミニウムの発送時の温度を推定してその時刻及び温度を表示するようにしてもよい。或いは推定された温度により第２の炉２１を自動的に温度制御しても良い。容器１００に収容すべき溶融アルミニウムの量についても上記「量データ」に基づき決定してもよい。

【００４７】発送時刻に容器１００を載せたトラック３２が出発し、公道３０を通り第１の工場１０に到着すると、容器１００がトラック３２から受け入れ部の受け入れ台１７に受け入れられる。

【００４８】その後、受け入れられた容器１００は、受け入れ台１７と共に配送車１８により所定のダイキャストマシーン１１まで配送され、容器１００から保持炉１２に溶融アルミニウムが供給される。

【００４９】図２に示すように、この例では、レシーバタンク１０１から高圧空気を密閉された容器１００内に送出することで容器１００内に収容された溶融アルミニウムが配管５６から吐出されて保持炉１２内に供給されるようになっている。なお、図２において、１０３は加圧バルブ、１０４はリークバルブである。

【００５０】ここで、保持炉１２の高さは各種のものがあり、配送車１８に設けられた昇降機構により配管５６の先端が保持炉１２上の最適位置となるように調節可能になっている。しかし、保持炉１２の高さによっては昇降機構だけでは対応できない場合がある。そこで、本システムにおいては、保持炉１２の形態に関する「形態データ」として、保持炉１２の高さや保持炉１２までの距離に関するデータ等を予め第２の工場２０側に送り、第２の工場２０側ではこのデータに基づき最適な形態、例えば最適な高さの容器１００を選択して配送している。なお、供給すべき量に応じて最適な大きさの容器１００を選択して配送してもよい。

【００５１】次に、このように構成されたシステムに好適な容器（加圧式溶融金属供給容器）１００について、図３及び図４に基づき説明する。図３は容器１００の断面図、図４はその平面図である。

【００５２】容器１００は、有底で筒状の本体５０の上部開口部５１に大蓋５２が配置されている。本体５０及び大蓋５１の外周にはそれぞれフランジ５３、５４が設けられており、これらフランジ間をボルト５５で締めることで本体５０と大蓋５１が固定されている。なお、本体５０や大蓋５１は例えば外側が金属であり、内側が耐火材材及び断熱材により構成されている。

【００５３】本体５０の外周の１箇所には、本体５０内部から配管５６に連通する流路５７が設けられた配管取付部５８が設けられ、この配管取付部５８の流路５７に連通するように配管５６が固定されている。配管５６は、「状の形状を有しており、これにより配管５６の一端口５９は下方を向いている。より具体的には、配管５６の一端口５９は垂線に対して例えば１０°程度傾いている。このように傾斜を持たせることによって例えば一端口５９から導出される溶融金属がサーバ側に流れ落ちた際に湯面から湯滴が飛び散ることが少なくなる。

【００５４】上記の大蓋５２のほぼ中央には開口部６０が設けられ、開口部６０には取っ手６１が取り付けられたハッチ６２が配置されている。ハッチ６２は大蓋５２上面よりも少し高い位置に設けられてる。ハッチ６２の外周の1ヶ所にはヒンジ６３を介して大蓋５２に取り付けられている。これにより、ハッチ６２は大蓋５２の開口部６０に対して開閉可能とされている。また、このヒンジ６３が取り付けられた位置と対向するように、ハッチ６２の外周の２ヶ所には、ハッチ６２を大蓋５２に固定するためのハンドル付のボルト６４が取り付けられている。大蓋５２の開口部６０をハッチ６２で閉めてハンドル付のボルト６４を回動することでハッチ６２が大蓋５２に固定されることになる。また、ハンドル付のボルト６４を逆回転させて締結を開放してハッチ６２を大蓋５２の開口部６０から開くことができる。そして、ハッチ６２を開いた状態で開口部６０を介して容器１００内部のメンテナンスや予熱時のガスバーナの挿入が行われるようになっている。

【００５５】また、ハッチ６２の中央、或いは中央から少しずれた位置には、容器１００内の減圧及び加圧を行うための内圧調整用の貫通孔６５が設けられている。この貫通孔６５には加減圧用の配管６６が接続されている。この配管６６は、貫通孔６５から上方に伸びて所定の高さで曲がりそこから水平方向に延在している。この配管６６の貫通孔６５への挿入部分の表面には螺子山がきられており、一方貫通孔６５にも螺子山がきられており、これにより配管６６が貫通孔６５に対して螺子止めにより固定されるようになっている。

【００５６】この配管６６の一方には、加圧用又は減圧

用の配管６７が接続可能になっており、加圧用の配管には加圧気体に蓄積されたタンクや加圧用のポンプが接続されており、減圧用の配管には減圧用のポンプが接続されている。そして、減圧により圧力差を利用して配管５６及び流路５７を介して容器１００内に溶融アルミニウムを導入することが可能であり、加圧により圧力差を利用して流路５７及び配管５６を介して容器１００外への溶融アルミニウムの導出が可能である。なお、加圧気体として不活性気体、例えば窒素ガスを用いることで加圧時の溶融アルミニウムの酸化をより効果的に防止することができる。

【００５７】本実施形態では、大蓋５２のほぼ中央部に配置されたハッチ６２に加減圧用の貫通孔６５が設けられている一方で、上記の配管６６が水平方向に延在しているので、加圧用又は減圧用の配管６７を上記の配管６６に接続する作業を安全にかつ簡単に行うことができる。また、このように配管６６が延在することによって配管６６を貫通孔６５に対して小さな力で回転させることができるので、貫通孔６５に対して嵌子止めされた配管６６の固定や取り外しを非常に小さな力で、例えば工具を用いることなく行うことができる。

【００５８】ハッチ６２の中央から少しずれた位置で前記の加減圧用の貫通孔６５とは対向する位置には、圧力開放用の貫通孔６８が設けられ、圧力開放用の貫通孔６８には、リリーフバルブ（図示を省略）が取り付けられるようになっている。これにより、例えば容器１００内が所定の圧力以上となったときには安全性の観点から容器１００内が大気圧に開放されるようになっている。

【００５９】大蓋５２には、液面センサとしての２本の電極６９がそれぞれ挿入される液面センサ用の２つの貫通孔７０が所定の間隔をもって配置されている。これらの貫通孔７０には、それぞれ電極６９が挿入されている。これら電極６９は容器１００内で対向するように配置されており、それぞれの先端は例えば容器１００内の溶融金属の最大液面とほぼ同じ位置まで延びている。そして、電極６９間の導通状態をモニタすることで容器１００内の溶融金属の最大液面を検出することが可能であり、これにより容器１００への溶融金属の過剰供給をより確実に防止できるようになっている。

【００６０】本体５０の底部裏面には、例えばフォークリフトのフォーク（図示を省略）が挿入される断面口形状で所定の長さの脚部（チャンネル）７１が例えば平行するように２本配置されている。また、本体５０内側の底部は、流路５７側が低くなるように全体が傾斜している。これにより、加圧により流路５７及び配管５６を介して外部に溶融アルミニウムを導出する際に、いわゆる湯の残りが少なくなる。また、例えばメンテナンス時に容器１００を傾けて流路５７及び配管５６を介して外部に溶融アルミニウムを導出する際に、容器１００を傾ける角度をより小さくでき、安全性や作業性が優れたものとなる。

【００６１】このように本実施形態に係る容器１００では、ハッチ６２に内圧調整用の貫通孔６５を設け、その貫通孔６５に内圧調整用の配管６６を接続しているので、容器１００内に溶融金属を供給する度に内圧調整用の貫通孔６５に対する金属の付着を確認することができる。従って、内圧調整に用いるための配管６６や貫通孔６５の詰りを未然に防止することができる。

【００６２】また、本実施形態に係る容器１００では、ハッチ６２に内圧調整用の貫通孔６５が設けられ、しかもそのハッチ６２が溶融アルミニウムの液面の変化や液滴が飛び散る度合いが比較的に小さい位置に対応する容器１００の上面部のほぼ中央に設けられているので、溶融アルミニウムが内圧調整に用いるための配管６６や貫通孔６５に付着することが少なくなる。従って、内圧調整に用いるための配管６６や貫通孔６５の詰りを防止することができる。

【００６３】更に、本実施形態に係る容器１００では、ハッチ６２が大蓋５２の上面部に設けられているので、ハッチ６２の裏面と液面との距離が大蓋５２の裏面と液面との距離に比べて大蓋５２の厚み分だけ長くなる。従って、貫通孔６５が設けられたハッチ６２の裏面にアルミニウムが付着する可能性が低くなり、内圧調整に用いるための配管６６や貫通孔６５の詰りを防止することができる。

【００６４】次に、第２の工場２０における第２の炉２１から容器１００への供給システムを図５に基づき説明する。

【００６５】図５に示すように、第２の炉２１内には溶融アルミニウムが貯留されている。この第２の炉２１には供給部２１ａが設けられ、この供給部２１ａには吸引管２０１が挿入されている。この吸引管２０１は、供給部２１ａの溶融されたアルミニウムの液面から一端口（吸引管２０１の他方の先端部２０１ｂ）が出没するように配置されている。すなわち、吸引管２０１の一方の先端部２０１ａは第２の炉２１の底部付近まで延在し、吸引管２０１の他方の先端部２０１ｂは供給部２１ａから外側に導出されている。吸引管２０１は、保持機構２０２により基本的には傾斜して保持されている。その傾斜角は例えば垂線に対して１０°程度傾いており、上記容器１００における配管５６の先端部の傾斜と合致するようになっている。この吸引管２０１の先端部２０１ｂは容器１００における配管５６の先端部に接続されるものであり、このように傾斜を合致されることによって吸引管２０１の先端部２０１ｂと容器１００における配管５６の先端部との接続が容易となる。

【００６６】そして、配管６６に減圧用のポンプ３１３に接続された配管６７を接続する。次に、ポンプ３１３を作動させて容器１００内を減圧する。これにより、第２の炉２１内に貯留されている溶融アルミニウムが吸引

管２０１及び配管５６を介して容器１００内に導入される．

【００６７】本実施形態では，特に，このように第２の炉２１内に貯留されている溶融アルミニウムを吸引管２０１及び配管５６を介して容器１００内に導入するようにしているので，溶融アルミニウムが外部の空気と接触することはない．従って，酸化物が生じることがなく，本システムを用いて供給される溶融アルミニウムは非常に品質が良いものとなる．また，容器１００内から酸化物を除去するための作業は不要となり，作業性も向上する．

【００６８】本実施形態では，特に，容器１００に対する溶融アルミニウムの導入と容器１００からの溶融アルミニウムの導出を実質的に２本の配管５６，３１２だけを使って行うことができるので，システム構成を非常にシンプルなものとすることができる．また，溶融アルミニウムが外気に接触する機会が激減するので，酸化物の生成をほぼなくすことができる．

【００６９】図６は以上のシステムを自動車工場に適用した場合の製造フローを示したものである．

【００７０】まず，図５に示したように，第２の炉２１内に貯留されている溶融アルミニウムを吸引管２０１及び配管５６を介して容器１００内に導入（受湯）する（ステップ５０１）．

【００７１】次に，図１に示したように，容器１００を公道３０を介してトラック３２により第２の工場２０から第１の工場１０に搬送する（ステップ５０２）．

【００７２】次に，第１の工場（ユースポイント）１０では，容器１００が配送車１８により自動車エンジン製造用のダイキャストマシーン１１まで配送され，容器１００から保持炉１２に溶融アルミニウムが供給される（ステップ５０３）．

【００７３】次に，このダイキャストマシーン１１において，保持炉１２に貯留された溶融アルミニウムを用いた自動車エンジンの成型が行われる（ステップ５０４）．

【００７４】そして，このように成型された自動車エンジン及び他の部品を使って自動車の組み立てが行われ，自動車が完成する（ステップ５０５）．

【００７５】本実施形態では，上述したように自動車のエンジンが酸化物を殆ど含まないアルミニウム製であるので，性能及び耐久性のよいエンジンを有する自動車を製造することが可能である．

【００７６】本発明の更に別の実施形態を説明する．

【００７７】図７は本発明の第２の実施形態に係る容器の断面図である．同図では傾斜させた状態が示されている．

【００７８】同図に示す容器２１００は，容器本体２１１０と，容器本体２１１０の中心２１１１からずれた位置２１１２から容器本体２１１０外に配設された配管２１３０とを具備する．

【００７９】容器本体２１１０はその上部に開口２１１３を有し，その開口２１１３を塞ぐように蓋２１１４が装着されている．

【００８０】容器本体２１１０は，第１の空間２１１５を構成する例えばＳＳ４００（ＪＩＳ）などの鋼からなる第１のフレーム２１１６と，第１のフレーム２１１６との間に第２の空間１１７を構成するように配設された例えばＳＳ４００（ＪＩＳ）などの鋼からなる第２のフレーム２１１８とを有する．これらフレーム材料は線膨張率の小さな材料から構成することが好ましく，また内層に施工するキャスターなどの断熱材料との線膨張率の差が小さな材料を採用することが好ましい．さらに第１のフレームと第２のフレームとはその物性を協調させることが好ましくここでは同一物性を有する材料を選択して採用している．

【００８１】容器本体２１１０の底部には，フォークリフトのフォークが挿入される１対の□の字状の係止部材２１１９，２１１９が取り付けられている．

【００８２】蓋２１１４には，そのほぼ中心寄りに容器本体２１１０内に例えばアルミニウム等の金属の溶湯２１２０を注入するための開口２１２１が設けられ，その開口２１２１には子蓋２１２２が抱着されて図示を省略した固定具により開口２１２１に子蓋２１２２が固定されるようになっている．

【００８３】また，蓋２１１４には，図示を省略した加圧ポンプから加圧用の気体を容器本体２１１０内の第１の空間２１１５に導入するための導入口２１２３が設けられている．上記気体として窒素ガス等の不活性ガスを用いることで溶湯２１２０の酸化を防止することができる．

【００８４】更に，蓋２１１４には，容器本体２１１０の中心２１１１からずれた位置２１１２から容器本体２１１０外に配設された配管２１３０が取り付けられている．配管２１３０の下端２１３１は容器本体２１１０内の底部付近まで位置している．この下端２１３１を開閉自在とする機構を設けても構わない．これにより，容器が倒れたときに湯が流出することを防止することが可能となる．配管２１３０は，容器本体２１１０外において，例えば上方に向けて５°～１０°程度傾斜する傾斜部２１３２と，下方に向けて開口する吐出部２１３３とを有する．

【００８５】ここで，容器本体２１１０の中心２１１１と上記ずれ位置２１１２との間隔は，例えば内径８０ｃｍの容器の場合で３０ｃｍ程度である．この変位はもっと大きくても小さくても同様の効果を得ることができる．

【００８６】このような容器２１００では，まず水平状態で，導入口２１２３から加圧気体を導入し，容器本体２１１０内の溶湯２１２０を配管２１３０から外部に圧

送する．その後，図７に示すようにフォークリフトで配管２１３０側に傾斜させて，残りの溶湯２１２０を配管２１３０から外部に圧送する．

【００８７】このように構成された本実施形態の容器２１００では，配管２１３０が容器本体２１１０の中心からずれているので，傾けたときに容器本体２１１０内の液面に対する変位が大きくなり，この状態で溶湯を吐き出した後水平に戻すと配管２１３０の下端２１３１と溶湯２１２０面との間に空間ができ，配管詰まりが防止される．

【００８８】図８は本発明の第３の実施形態に係る容器の断面図である．以下の実施形態で既に図示した構成要素と同一の構成要素には同一の符号を付して説明を省略する．

【００８９】この容器２２００では，第１の空間２１１５と第２の空間２１１７とを接続する少なくとも１つの通路（配管）２２１０が設けられている．

【００９０】第２の空間２１１７には，加圧機構２２２０及びリークバルブ２２３０が取り付けられている．

【００９１】加圧機構２２２０では，加圧バルブ２２２１及び減圧弁を２２２２を介してエアータンク２２２３から第２の空間２１１７に加圧エアーが導入されるようになっている．また加圧機構２２２０には圧力コントーラ２２２４が取り付けられている．

【００９２】なお，加圧機構２２２０に代えて真空ポンプを接続することも可能である．

【００９３】このように構成された容器２２００では，第２の空間２１１７を真空に引いておけば保温になり，断熱材の経時変化による断熱性能の低下を補償することができる．例えば経時変化に応じて真空度を高めるようにすればよい．

【００９４】また，このように構成された容器２２００では，通路２２１０を介して第２の空２１１６間側から第１の空間２１１５を加圧すると，圧送気体は予熱されてから容器内部（第１の空間２１１５）に供給される．従って，溶湯の温度低下を小さく抑えることができる．特に，圧送最終段階においては溶湯と気体の間欠吐出が発生しやすく，その場合に溶湯の温度が圧送気体に奪われて粘性が大きくなる．従って，圧送気体を予熱することで，溶湯の温度低下を抑制し，配管詰まりを効果的に防止することができる．加えて，安全な給湯停止もでき，給湯停止に要する時間を短くすることができる．

【００９５】更に，このように構成された容器２２００では，リークバルブ２２３０により第１の空間２１１５のリークを通路２２１０を介して第２の空間２１１７側から行うようにすることで，高温気体をある程度冷やしてからリークバルブ２２３０からリークしている．よって，リークバルブ２２３０にかかる熱的負荷を軽減し，装置の信頼性向上，長寿命化を図ることができる．

【００９６】図９は本発明の第４の実施形態に係る容器の断面図である．

【００９７】同図に示す容器２３００では，第１の空間２１１５に加圧機構２２２０が接続され，第２の空間２１１７に減圧機構２３１０が接続されている．減圧機構２３１０では，例えば真空バルブ２３１１を介して真空ポンプ２３１２が第２の空間２１１７に接続され，それらの間に真空計２３１３やリークバルブ２３１４が介挿されている．

【００９８】また，第１の空間２１１５と第２の空間２１１７とを接続する通路２２１０には，第２のバルブとしてのリークバルブ２３２０が介挿され，更に容器本体内には第１のバルブとしてのリークバルブ２３２１が接続されている．

【００９９】このような構成の容器２３００では，給湯停止動作に要する時間短縮，もしくは停止動作の信頼性の向上を図ることができる．すなわち，第２の空間２１１７は減圧しておき，給湯停止時には，まず第１のバルブとしてのリークバルブ２３２１を開放して第１の空間２１１５内を復圧する．ついで第２のバルブとしてのリークバルブ２３２０を開放し第１の空間２１１５を負圧にする．これにより完全な給湯停止，更には配管内の溶湯の容器側への引き戻しができる．

【０１００】図１０は本発明の第５の実施形態に係る容器の断面図である．

【０１０１】同図に示す容器２４００では，上方に向かう傾斜を有する配管２４２０が容器本体２４１０底部付近に接続されている．配管２４２０の他端は少なくとも容器２４００より高い位置まで延びている．

【０１０２】図１１は本発明の第６の実施形態に係る容器の断面図である．

【０１０３】同図に示す容器２５００では，容器本体２５１０内を下部付近で連通しつつ２分する隔壁２５２０と，隔壁２５２０で区切られた一方の空間２５３０側に接続された樋部２５４０とを具備する．他方の空間２５３１には，加圧機構２２２０が接続されている．桶部２５４０の上部には蓋２５４１が設けられている．

【０１０４】本実施形態の容器２５００では，加圧機構２２２０により容器内を加圧すると，樋部２５４０を介して容器内の湯が外部に吐出される．

【０１０５】すなわち，配管が本体内部にあると，
メンテが大変
詰まりやすい
メンテ時に配管傷つきやすい
という問題ある．

【０１０６】これに対して本実施形態の容器２５００では，隔壁２５２０で分離された一方の空間２５３０を配管の代わりに使用し，例えば開口部２５３２からオーバーフローさせて樋部２５４０で給湯するものである．これによりメンテナンスが非常に簡単になり，しかも詰まりにくく，更には詰まっても通常メンテナンスで回復さ

せることができる．

【０１０７】図１２は本発明の第７の実施形態に係る容器の断面図である．

【０１０８】同図に示す容器２６００は．図１１に示した容器における桶部２５４０の上部に配置された蓋２５４１を取り除いたものである．

【０１０９】

【発明の効果】以上説明したように．本発明によれば．内圧調整に用いるための配管や孔の詰りを防止することができる．

【図面の簡単な説明】

【図１】本発明の一実施形態に係る金属供給システムの構成を示す概略図である．

【図２】本発明の一実施形態に係る容器と保持炉との関係を示す図である．

【図３】本発明の一実施形態に係る容器の断面図である．

【図４】図３の平面図である．

【図５】本発明の一実施形態に係る第２の工場における第２の炉から容器への供給システムの構成を示す図である．

【図６】本発明のシステムを使った自動車の製造方法を示すフロー図である．

【図７】第２の実施形態に係る容器の断面図である．

【図８】第３の実施形態に係る容器の断面図である．

【図９】第４の実施形態に係る容器の断面図である．

【図１０】第５の実施形態に係る容器の断面図である．

【図１１】第６の実施形態に係る容器の断面図である．

【図１２】第７の実施形態に係る容器の断面図である．

【符号の説明】

５０　容器本体

５１、６０　開口部

５７　流路

６２　ハッチ

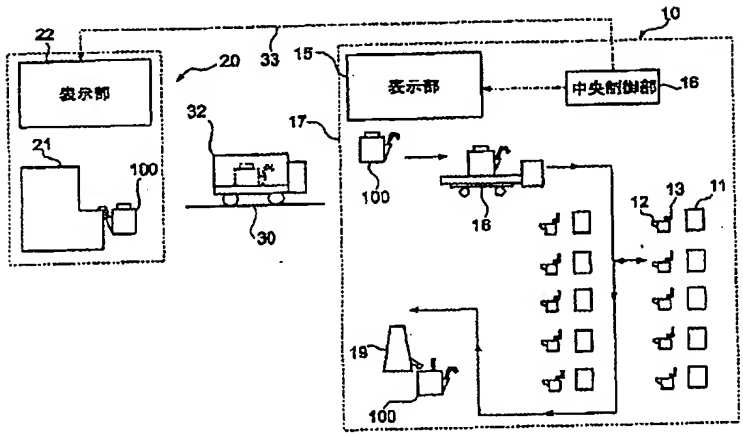
６５　内圧調整用の貫通孔

６６　内圧調整用の配管

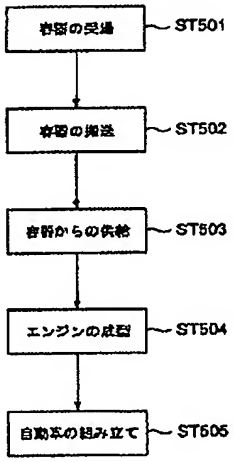
６０　開口

１００　溶融金属供給用容器

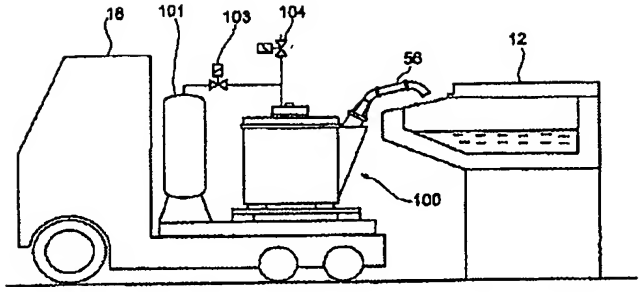
【図１】



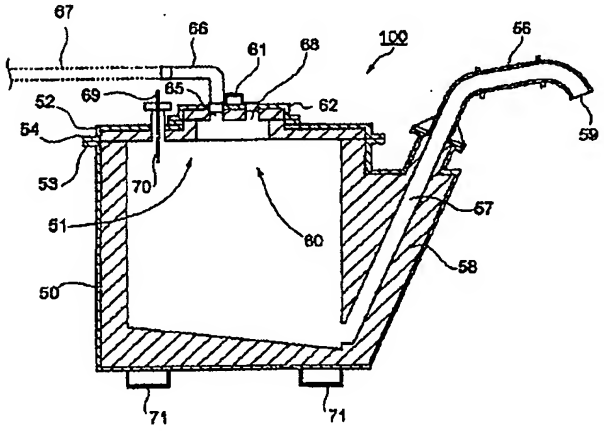
【図６】



[図２]


18
101
103
104
56
12
100

[図３]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55
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62
54
59
53
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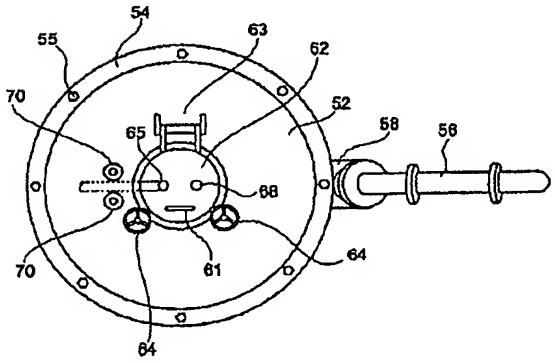
57
51
60
58
50
71
71

[図４]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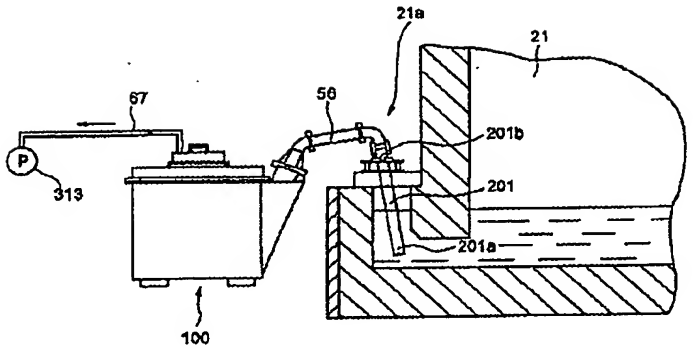
52
58
56
65
68
70
61
64
64

【図５】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21
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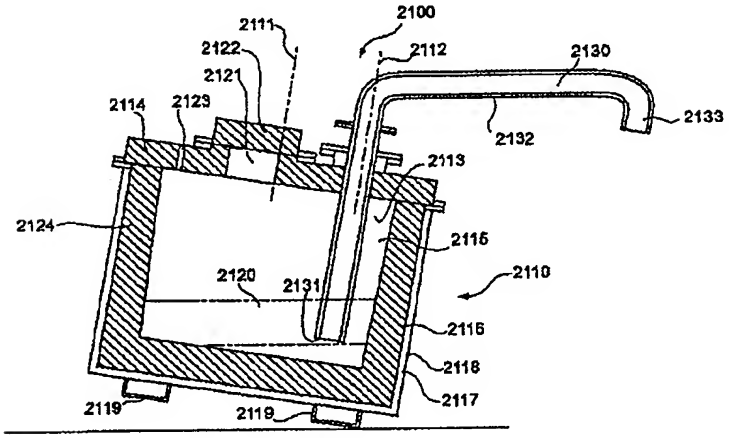
56
201b
P
313
201
201a
100

【図７】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2123
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2132
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2124
2115
2120
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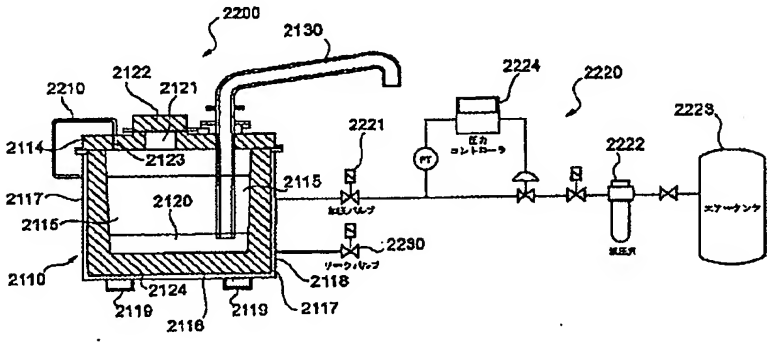
2110
2116
2118
2117
2119
2119

【図８】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2114
2123
PT
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2115
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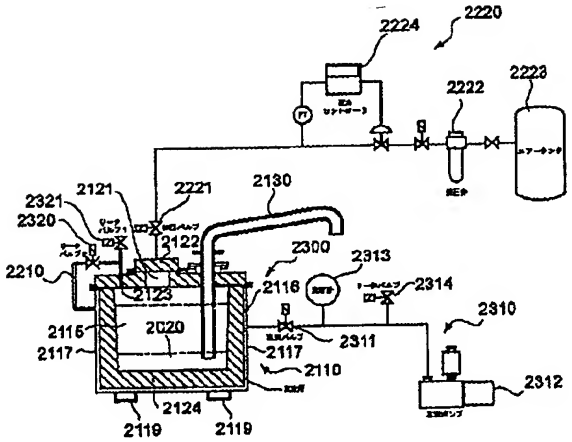
2120
2115
2230
2110
2118
2124
2119
2119
2117
2116

【図９】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2220
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2222
2221
2130
2121
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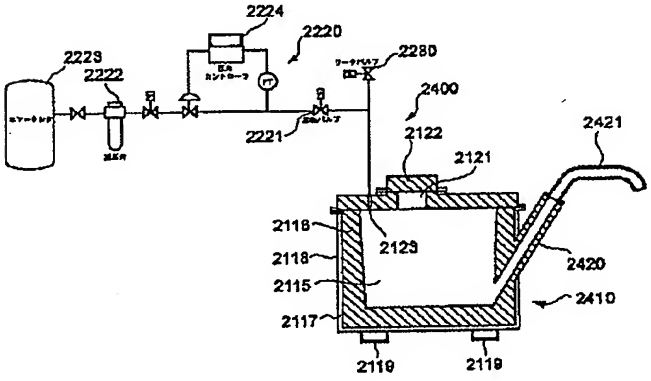
2320
2122
2300
2313
2210
2123
2116
2314
2310
2115
2020
2311
2117
2110
2312
2124
2119
2119

【図１０】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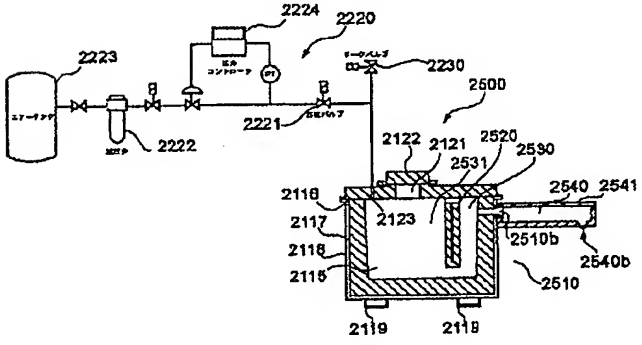
2222
2400
2221
2122
2421
2121
2118
2123
2420
2118
2115
2410
2117
2119
2119

【図１１】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2220
2223
2230
2500
2221
2222
2122
2121
2520
2530
2531
2540
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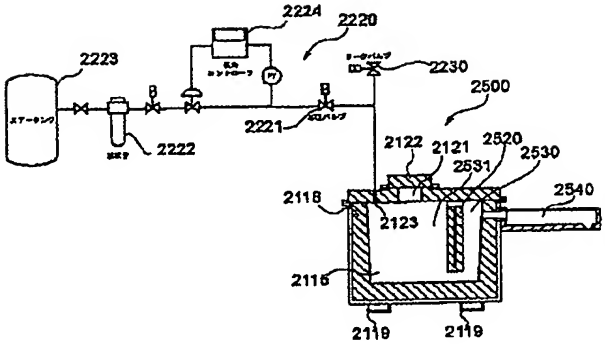
2118
2123
2117
2510b
2540b
2118
2115
2510
2119
2119

【図１２】



【手続補正書】
【提出日】平成１３年１２月５日（２００１．１２．５）
【手続補正１】
【補正対象書類名】明細書
【補正対象項目名】特許請求の範囲
【補正方法】変更
【補正内容】
【特許請求の範囲】
【請求項１】　溶融金属を収容することができる容器と、
前記容器の上面部に開閉可能に設けられ、前記容器の内外を連通する内圧調整用の貫通孔が設けられたハッチと、
前記容器の上面部で、かつ、該上面部の中心から前記貫通孔までの距離よりも離れた位置に設けられ、前記容器の内外を連通し、前記溶融金属を流通することが可能な流路とを具備することを特徴とする溶融金属供給用容器。
【請求項２】　溶融金属を収容することができる容器と、
前記容器の上面部に開閉可能に設けられ、前記容器の内外を連通する内圧調整用の貫通孔が設けられたハッチと、
前記容器の側面に設けられ、前記容器の内外を連通し、前記溶融金属を流通することが可能な流路とを具備することを特徴とする溶融金属供給用容器。
【請求項３】　請求項１又は請求項２に記載の溶融金属供給用容器において、
前記ハッチは、前記容器の上面部のほぼ中央に設けられていることを特徴とする溶融金属供給用容器。
【請求項４】　請求項１から請求項３のうちいずれか１項に記載の溶融金属供給用容器において、
前記貫通孔に取り付けられ、前記容器の上面部から上方に向けて突出し、所定の高さの位置で水平方向に折り曲げられ、接続部が水平方向に導出された配管を更に具備することを特徴とする溶融金属供給用容器。
【請求項５】　請求項４に記載の溶融金属供給用容器において、
前記配管は、前記貫通孔に着脱可能に螺着されていることを特徴とする溶融金属供給用容器。
【請求項６】　溶融金属を収容することができ、内外を連通し、上面部のほぼ中心の位置に設けられた内圧調整用の貫通孔を有する容器と、
前記容器の上面部で、かつ、該上面部の中心から前記貫通孔までの距離よりも離れた位置に設けられ、前記容器の内外を連通し、前記溶融金属を流通することが可能な流路とを具備したことを特徴とする溶融金属供給用容器。
【請求項７】　溶融金属を収容することができ、内外を連通し、上面部のほぼ中心の位置に設けられた内圧調整用の貫通孔を有する容器と、
前記容器の側面に設けられ、前記容器の内外を連通し、前記溶融金属を流通することが可能な流路とを具備したことを特徴とする溶融金属供給用容器。
【請求項８】　請求項６又は請求項７に記載の溶融金属供給用容器において、
前記容器は、当該容器の上面部のほぼ中心部に設けられたハッチを更に具備し、
前記貫通孔は、前記ハッチに設けられていることを特徴とする溶融金属供給用容器。
【請求項９】　請求項６から請求項８のうちいずれか１項に記載の溶融金属供給用容器において、
前記貫通孔に取り付けられ、前記容器の上面部から上方に向けて突出し、所定の高さの位置で水平方向に折り曲げ

られ、接続部が水平方向に導出された配管を更に具備することを特徴とする溶融金属供給用容器．
【請求項１０】　請求項９に記載の溶融金属供給用容器において、
前記配管は、前記容器に着脱可能に螺着されていることを特徴とする溶融金属供給用容器．
【請求項１１】　溶融金属を収容することができ、上部に第１の開口部を有する容器と、
前記容器の内外を連通し、前記溶融金属を流通することが可能な流路と、
前記容器の第１の開口部を覆うように配置され、ほぼ中央に前記第１の開口部よりも小径の第２の開口部を有する蓋と、
前記蓋の上面部に開閉可能に設けられ、前記容器の内外を連通する内圧調整用の貫通孔が設けられたハッチとを具備することを特徴とする溶融金属供給用容器．
【請求項１２】　請求項１１に記載の溶融金属供給用容器において、
前記貫通孔に取り付けられ、前記容器の上面部から上方に向けて突出し、所定の高さの位置で水平方向に折り曲げられ、接続部が水平方向に導出された配管を更に具備することを特徴とする溶融金属供給用容器．
【請求項１３】　請求項１２に記載の溶融金属供給用容器において、
前記配管は、前記貫通孔に着脱可能に螺着されていることを特徴とする溶融金属供給用容器．

【手続補正書】
【提出日】平成１４年３月４日（２００２．３．４）
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【特許請求の範囲】
【請求項１】　溶融金属を収容することができ、上部に第１の開口部を有する容器と、
前記容器の内外を連通し、前記溶融金属を流通することが可能な流路と、
前記容器の第１の開口部を覆うように配置され、ほぼ中央に前記第１の開口部よりも小径の第２の開口部を有する蓋と、
前記蓋の上面部に開閉可能に設けられ、前記容器の内外を連通する内圧調整用の貫通孔が設けられたハッチとを具備することを特徴とする溶融金属供給用容器．
【請求項２】　請求項１に記載の溶融金属供給用容器において、
前記貫通孔に取り付けられ、前記容器の上面部から上方に向けて突出し、所定の高さの位置で水平方向に折り曲げられ、接続部が水平方向に導出された配管を更に具備することを特徴とする溶融金属供給用容器．
【請求項３】　請求項２に記載の溶融金属供給用容器において、
前記配管は、前記貫通孔に着脱可能に螺着されていることを特徴とする溶融金属供給用容器．